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Design for Environment (DfE) Opportunities within Alberta's Waste Stewardship Programs

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EXECUTIVE SUMMARY

Alberta Environment would like to build on its long history of environmental stewardship by assessing design for environment (DfE) opportunities within its current Waste Stewardship Programs: i) used oil and oil products, ii) non-milk beverage containers, iii) waste electronics and iv) scrap tires. This report assesses how each of Alberta's existing stewardship programs ***align*** with criteria for effectively stimulating design for environment and pollution prevention and whether DfE is ***relevant*** to each program or product group. The report also identifies ***opportunities*** for Alberta Environment to stimulate design for environment and pollution prevention activities in industry, in order to evolve its waste management programs and take a broader approach that prevents waste and improves product environmental impacts across the life cycle.

Assessment of Alberta's current waste stewardship programs with respect to DfE

A review of current Alberta waste stewardship programs indicated the programs were not designed to promote DfE and are therefore poorly aligned with DfE. Each is strictly a waste management program focused on how to best recover and recycle the material stream at end of life. Based on information obtained through interviews with DAO managers, managers of programs in other jurisdictions and experts in the area of DfE, it was determined that DfE is most relevant to Alberta's electronics and beverage container recycling programs. Rapid innovation cycles and the availability of alternative materials means there are considerable opportunities to take environmental performance improvements into account in the design phase. The presence of programs – both those that have shown results (Green Dot, UK WRAP) and those still in early stages of development (EU IPP, Stewardship Ontario, State of Minnesota) in other jurisdictions focusing on these products means Alberta can learn what has, what has not and what might work for them. With the tire and used oil stewardship program there are fewer DfE opportunities; therefore, Alberta should place less emphasis on integrating DfE in these product categories.

Promoting DfE in other jurisdictions

There are three main approaches governments take to promote DfE in industry – a 'pull' or voluntary approach (e.g., informative or supportive programs, public procurement, voluntary agreements), a 'push' or regulatory approach (e.g., obligatory take back, material ban) or a combination of both. This study reviewed the practices of five public sector jurisdictions reflecting a range of these approaches. Interviews with international experts and managers of programs who have attempted to incorporate DfE into their stewardship programs demonstrate that it is still too early to draw conclusive evidence on which approach is *most* effective in promoting DfE among producers.[1] The concepts of producer responsibility and DfE continue to evolve and there is no simple or flawless model to adopt in order to achieve DfE results.

Two of the programs reviewed report design changes in industry (UK WRAP and German Green Dot Program[2]), the European Commission's IPP Pilot Projects are still underway therefore it is still too early to measure results while Minnesota's Office of Environmental Assistance and Stewardship Ontario are still working to find the right policy levers to effectively promote DfE in electronics and

[1] In this report "producer" refers to manufacturers and importers.
[2] See Section IV: Which Jurisdictions Have Attempted to Incorporate DfE into their Waste Stewardship Programs.

packaging. Recognizing none of these five programs put forward an entirely effective model for promoting DfE, it is important to consider the lessons – including successes *and* failures – which can be drawn from each example.

Regulatory approaches are driving design changes in the electronics and electrical equipment industry in Europe. For example the Restrictions on Hazardous Substances Directive (RoHS) requires producers to substitute alternatives for mercury, hexavalent chromium, lead and other heavy metals in certain applications. The Waste Electronic and Electrical Equipment (WEEE) Directive sets mandatory reuse and recycling targets of more than 65-75% depending on the product. Producers who want to sell products into the European marketplace must comply with these requirements. Germany's Packaging Ordinance supported by the Green Dot Program has also driven design changes in beverage packaging in Germany and across Europe. Stewardship Ontario currently sets recycling targets for specific product categories and is looking to broaden the program to better stimulate design changes. Alternatively, the UK's Waste Minimisation and Resources Action Programme (WRAP) and US EPA's Design for Environment Program are voluntary programs that report design changes in industry.

In each case, it is clear there must be an incentive for producers to redesign their products to have an improved impact over the life cycle. These incentives can be achieved through customer demand, obligatory take back or material bans, or in the form of an economic or informative incentive (e.g., differentiated taxes, public procurement, R&D funding or technical support).

Challenges governments face when promoting DfE

The following were mentioned in interviews as common challenges public sector jurisdictions face when trying to promote DfE in industry. *Section IV: Common Challenges* describes each of these in more detail. Alberta Environment may or may not face these challenges in each of the product waste streams it currently manages: however, the study team felt they were important items for Alberta Environment to be aware of as it moves forward.

- Ability to influence the market
- Working together with other public sector jurisdictions
- Moving from collective systems to individual responsibility
- Providing tangible incentives for producers
- Lack of skills and resources
- Lack of direct customer demand
- Manufacturers' lack of trust in government

Opportunities for Alberta Environment to evolve its waste management programs to promote DfE

Despite the challenges, progressive Governments around the world are taking a leadership role in promoting DfE and moving away from the business of waste management. There are many risks associated with both managing waste at its end of life and not taking the design phase into account. These risks arise primarily from having to manage hazardous materials in collection, recycling and

disposal systems which can lead to risk of accidents, liability and health and safety costs; as well as risk of non-compliance with health, safety and environment regulations. There are also benefits for governments who effectively stimulate DfE activities among industry (bottom line benefits through cost avoidance of lower waste management fees and hazardous material management fees, developing markets for more sustainable products and services, improved employee and community health through cleaner air and water, reduced demand for landfill space, lower demand for resources, etc.). As consumers and businesses begin to shift to the design and purchase of more sustainable products and services, stimulating innovation through DfE may lead to economic development benefits.

Based on expert interviews and our experience, the following key actions are recommended for Alberta Environment to broaden its waste management programs to better promote DfE. If Alberta Environment wants to better promote DfE it will need to select pieces from other programs that suit its specific policy context. Alberta Environment can also choose to monitor the programs in other jurisdictions and wait to take action until one demonstrates a level of results it is satisfied with.

It is important to note the limited scope of the study when reviewing these recommendations. Programs from only five public sector jurisdictions were reviewed. It is therefore not an exhaustive study and Alberta Environment is encouraged to undertake additional research when moving forward with any recommendations.

- ***Send a signal that DfE is a future policy direction of Alberta Environment*** – Without determining and communicating a high-level policy direction on DfE, it is unlikely Alberta's current and future waste stewardship programs will broaden to promote improved product environmental performance over the life cycle through redesign. The degree to which DfE is a focus in each product or packaging category depends on the relevance to each category. For the electronics and beverage container recycling programs, any policy-related targets would be more extensive than for used oil and tires. DfE is being applied in other countries to products such as carpet, energy using products (including appliances, tools, electronics, personal hygiene accessories), vehicles and all streams of packaging because it has been determined these product categories have significant opportunities for improvement through redesign. It is, however, important for a policy on DfE to apply across all stewardship programs to show industry that the government is prepared to work with producers who come forward with innovative ideas, provide DAOs with the policy commitment they need to build in DfE targets and incentives, and lay the foundation for future stewardship programs to integrate DfE incentives in their initial program design.[3]

- ***Incorporate incentives into programs where there are significant DfE opportunities*** – Alberta's current beverage container and electronics recycling programs have no incentives for manufacturers to invest in creating innovative and environmentally preferable products. Both are designed to be collective arrangements where all players share the same risks and benefits for managing wastes. Based on our experience and expert interviews, it is recommended that Alberta Environment move towards individual systems where producers are given financial and physical responsibility for managing the waste. Experience in other jurisdictions indicates that if producers recycle and dispose of their discarded products, or bear the full costs of the recycling and

[3] Personal Interview with Doug Wright, Executive Director of ARMA. September 2005.

disposal, they will have more direct incentives to account for these costs in decisions about design and marketing.[4]

HP noted many provinces have already launched programs to deal with waste electronics but these do not contain the motivation and competitiveness elements for industry, necessary to be successful. Nokia and Electrolux, among others, called for "individual responsibility" in the European Union's WEEE Directive. In a press release, Electrolux stated it believes, "to minimize the additional costs to consumers, and maximize the level of recycling, there must be an incentive for producers to design appliances with more components that can be recycled more efficiently, and at a lower cost". Electrolux contends that if the EU elected to take a collective responsibility approach, "it would be nothing more than a waste tax. Producers unwilling to or unable to meet the new challenges will be able to hide behind the more responsible and effective companies in their industry. Collective Responsibility would also do nothing to encourage the development of environmentally improved products, or to resolve the issues of electrical and electronic waste in Europe."[5]

For electronics, Alberta Environment should analyze the incentives used, and ensuing results, in the States of Maine and California, as well as, the European Union. The systems adopted by each of these jurisdictions – and their lessons in terms of challenges and successes – could be adapted to suit Alberta's context and provide tangible DfE incentives for producers in a program where they are needed.

For beverage containers, Alberta Environment should consider how the structure, incentives (technical support, best in class data, research support, demonstration and pilot projects) and targets established within the UK's voluntary WRAP initiative could be applied in Alberta. In addition, Alberta Environment should study the variable fee structure utilized by Germany's Green Dot program over the last ten years (where producers internalize costs of managing the packaging), and collaborate with Stewardship Ontario as it works to establish variable fees and other DfE incentives in its program in the coming years.

Seven experts noted Government should use a suite of complementary policy tools as one policy tool cannot be applied to all products and stakeholders groups. Green procurement laws and coordinated product policy instruments were mentioned by many experts as key instruments to advance DfE. Many experts also noted a combination of push (regulatory drivers) and pull instruments (public procurement, consumer education) would yield the best success as it creates a level playing field while rewarding leading companies who take responsibility for managing their waste.[6]

- ***Leverage the experience of others*** – Effective stimulation of DfE by government is in its infancy, and many still face challenges as they move forward with their own programs. A lot can be learned from those who have already tried to encourage DfE efforts among producers in similar waste streams to those being managed in Alberta. Understanding the specific context around what has worked, and what has not, in other regions could help Alberta Environment avoid common

[4] Experts recommending a shift towards individual responsibility include Frances Edmonds (HP), Joanne St Godard (RCO), Chris van Rossem (Lund University), Garth Hickle (MOEA).

[5] Would you want to handle your neighbour's waste? Electrolux Group Press Release. http://www.cleanproduction.org/library/ElectroluxAD.pdf

[6] Experts noting a combination of push and pull policy tools included Frances Edmonds, Joanne St. Godard, Martin Charter, Chris van Rossem, Mark Barthel, Derek Stephenson, Garth Hickle.

pitfalls, overcome challenges and save time and resources required to create an entirely new program. Alberta Environment should work closely with managers of the German Green Dot (e.g., via the PRO Europe initiative[7]) to learn about what has stimulated DfE in the packaging industry in Europe, and with managers from Stewardship Ontario as it moves forward with the development of an incentive to promote DfE. Alberta Environment should also cooperate with the Province of Nova Scotia, States of Minnesota, Maine and California and the European Union on lessons learned in electronic waste management. The reality is producers *are* designing products and participating in collection programs that comply with directives in the European Union and regulations in other jurisdictions. Nokia launched a product program to adopt lead-free solder to ensure its 6650 cell phone was ready for the forthcoming ban on lead in electronic equipment.[8] Sony now uses its Green Partner Program – a supply chain management program launched in 2001 that pre-qualifies vendors under its strict environmental policies – to certify products for RoHS compliance.[9] Other public sector jurisdictions are also modelling their programs after those in the European Union. For example China is adopting its own directives that essentially mirror the language of the EU's RoHS and WEEE legislation.[10] The wheel does not need to be reinvented, but instead tweaked to suit Alberta's unique context.

- ***Evaluate potential for DfE in new stewardship programs*** – The Province is currently negotiating additional stewardship programs with a number of other product groups. For new stewardship opportunities, Alberta Environment should carefully evaluate different products for the potential to re-design to prevent waste and reduce environmental impacts and then work to incorporate credible incentives for producers.

- ***Develop a province wide procurement policy and strategy*** – Driving more sustainable product design through procurement was noted by six interviewees as an effective mechanism to support waste management policies and programs.[11] Providing a positive "pull" effect on the market is also viewed favourably by many leading producers who are willing to make design changes if they will be rewarded in the marketplace. The Government of Alberta can learn from the examples of many other Canadian provincial and municipal governments who have developed their own green or sustainable purchasing strategies, and even partner with these regions to align criteria and leverage more significant purchasing power (e.g., Province of British Columbia, Province of Quebec, Regional Municipality of Halifax, Regional Municipality of Whistler, City of Vancouver). Procurement is viewed by many jurisdictions as a complementary policy instrument to regulation. The European Union advocates that with so many different products and actors there cannot be one simple policy measure for everything. It therefore utilizes a variety of policy tools; its EU IPP Pilot Projects are complemented by regulation (Energy Using Products (EUP) Directive), promotion of green public procurement policies, and substance bans (Restrictions on Hazardous Substances (RoHS) Directive).[12]

- ***Educate the public about the importance of purchasing more sustainable products and services*** – Alberta Environment can play an educational role as well as a leadership role when it comes to

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[7] PRO Europe, Packaging Recovery Organisation in Europe. http://www.pro-e.org/

[8] Case Study: The Nokia 6650 Phone: Designed for Recyclability. http://www.nokia.com/link?cid=EDITORIAL_837

[9] The Greening of Consumer Electronics. September/October 2005. Written by Ron Schneiderman. http://members.ce.org/publications/vision/2005/sepoct/p18.asp?bc=bak&year=2005

[10] The Greening of Consumer Electronics. September/October 2005. Written by Ron Schneiderman. http://members.ce.org/publications/vision/2005/sepoct/p18.asp?bc=bak&year=2005

[11] Experts noting the value of public procurement included Bengt Davidsson (EC), Frances Edmonds (HP), Garth Hickle (MOEA), Martin Charter (Centre for Sustainable Design), Joanne St. Godard (RCO), Chris van Rossem (Lund).

[12] Personal Interview with Bengt Davisson. European Commission. October 2005.

the procurement of more sustainable products and services.[13] For DfE initiatives to achieve financial sustainability, producers call on governments to help raise awareness among consumers as they feel demand must reflect the same environmentally and socially preferable criteria advocated by other stakeholders. Government can educate the public about the benefits of buying more sustainable products and services for the individual and the Province. They can develop procurement tools such as checklists and total cost of ownership calculators that businesses and consumers can use when making purchases, and can inform the public about the range and types of products available carrying environmental or social labels (e.g., Environmental Choice, Fair Trade, EPEAT, Certified Organic, Blue Angel, LEED Certified, FSC Certified, etc). They can develop, or contribute to, publicly accessible national or international databases of life cycle information used to make product environmental performance improvements. Finally, government can set a good example through its own sustainable purchasing practice and communicate its own challenges and success stories advancing sustainable procurement.

- ***Develop national strategies for product and packaging categories where there are significant opportunities for environmental performance improvements through redesign*** – Seven experts indicated that the challenges associated with provincial or state run DfE programs might be overcome when governments partner together to create a more powerful influence.[14] Alberta Environment should strive to work at the national level (through CCME) or with other leading provinces to develop common principles for stewardship programs that include DfE as a primary focus. This collaborative effort should begin with electronics and beverage container recycling programs (as many provinces are already targeting these product categories and the CCME has established some Canada-Wide Principles for Electronic Products Stewardship), and should extend to the development of future stewardship programs. Putting forth a more consistent, national approach, would send a common signal to industry that government is serious about getting out of the business of managing waste, and would be efficient as provincial managers can pool their resources and expertise in the design and operation of each program (e.g., determining and updating metrics). Our experience with leading manufactures indicates that they are in favour of consistent national approaches when it comes to regulations, as it is often difficult and costly to comply with different programs in every province.

  When Member States in the European Union adopt similar policy directions and programs, companies can more efficiently and effectively meet the requirements of a larger, "single" market. Alberta has its own example with the Pesticide Container Management Program. Initially the industry association of pesticide producers (now CropLife Canada) pushed back as it did not want to voluntarily take responsibility for managing discarded packaging. Once Alberta proposed legislation, and Saskatchewan and Manitoba followed suit, the industry association responded out of fear other provinces might follow. It did not want to have to comply with three or more distinct pieces of legislation, each with a different set of rules, monitoring and reporting requirements etc). CropLife Canada took responsibility and rolled out a country-wide container management program (1989).[15] A similar experience occurred with the CCMEs 'voluntary' National Packaging Protocol where industry only really became engaged once a number of key provinces had backdrop legislation in place.

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[13] Experts calling for government to play an educational role included Martin Charter (Centre for Sustainable Design), Bengt Davidsson (EC), Frances Edmonds (HP), Joanne St. Godard (RCO).

[14] Experts recommending government cooperation included Garth Hickle (MOEA), Bengt Davidsson (EC), Frances Edmonds (HP), Joanne St Godard (RCO), Derek Stephenson (Stewardship Ontario), Chris van Rossem (Lund).

[15] Personal Interview with Janet McLean, Manager Land Systems at Alberta Environment. October 2005.

- ***Always take a life cycle approach*** – For all of the above recommendations, it is important to meet, partner and maintain dialogue with distributors, producers, recyclers, consumers and other actors across the product life cycle. Developing, or contributing to, publicly accessible national or international databases of life cycle information can also help government to identify environmental priorities and in turn, the most effective policy lever to utilize. Taking a life cycle approach is the best way to discover optimal environmental improvement options for a product, and to ensure an initiative to address a single-issue (waste volume) does not create adverse impacts elsewhere in the life cycle (e.g. transport-related emissions). The European Commission's Energy Using Products (EuP) Directive, referred to as Europe's first Integrated Product Policy Directive, was developed to take a life cycle approach to ensure the creation of a coherent framework for environmental product policy that avoids the adoption of uncoordinated measures that could lead to an overall negative result (i.e., eliminating a toxic substance from a product, such as mercury from lamps, might lead to increased energy consumption, which on balance would have a negative impact on the environment). Collaborating with other governments (at a provincial, national and international level) will improve the quality and quantity of available life cycle information.

I. ACKNOWLEDGEMENTS

The success of studies of this nature depends on the enthusiasm and cooperation of the participating organizations. Five Winds International would like to thank Patrick Kane and Janet McLean of the Alberta Government, and Dennis Hambleton, Bob Saari and Doug Wright of Alberta's Designated Administrative Organizations, who participated in the review of current practice and openly shared their insights and experiences. We would also like to thank the managers from the five public sector jurisdictions who took the time to share their experiences and expertise implementing their own stewardship programs, and our network of international experts who contributed insights on the role of government in supporting DfE initiatives among industry. The names of these individuals are contained in Appendix 4 (Public Sector Jurisdictions Interviewed) and Appendix 6 (International Experts on DfE and EPR).

Their open and honest sharing of information will assist Alberta Environment in its assessment of design for environment (DfE) opportunities in relation to the province's four Waste Stewardship Programs, and ultimately to keep pace with, and benefit from, innovative policy and program developments in the area of product stewardship.

We also extend our thanks to Patrick Kane and Jodi Tomchyshyn, the study sponsors, for contributing their time and insights throughout the project.

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II. CONTEXT

OVERVIEW OF ALBERTA'S WASTE STEWARDSHIP PROGRAMS

The Province of Alberta was an early adopter of waste stewardship programs in Canada. Since 1992, the Government of Alberta has actively developed regulations to formalize stewardship responsibilities in three Delegated Administrative Organizations (DAOs):

- Alberta Recycling Management Authority (ARMA), which manages Tire Recycling Alberta and Electronics Recycling Alberta;
- Beverage Container Management Board (BCMB); and
- Alberta Used Oil Management Association (AUOMA).

These DAOs operate at arms length from government and report directly to the Environment Minister. Each of the four waste stewardship programs is supported by a government regulation targeting a specific product category, has authority to generate revenue, has a dedicated fund to operate its program (collected from visible fees), and is managed by a multi-stakeholder board of directors.

The Province of Alberta has also taken on voluntary stewardship programs with pesticide containers, pharmaceutical products and dairy packaging, and is currently negotiating additional voluntary stewardship programs with a number of other product groups.

Each stewardship program has evolved from its predecessors as the Province continues to learn from its own experience and from that of other jurisdictions. All of the programs are based on the premise of managing waste at end of life in a manner that is responsible in terms of environmental impacts. The Government of Alberta is exploring how it can evolve its waste management programs to take a broader approach that prevents waste and reduces environmental impacts from products across the life cycle by promoting design for environment activities in industry.

CURRENT PRACTICE IN CANADA

The majority of provinces and territories in Canada have also developed waste stewardship programs. Environment Canada provides an inventory of these programs on their Extended Producer Responsibility & Stewardship website. The site profiles close to 50 programs that target common product and packaging categories such as used oil, tires, beverage packaging, pharmaceuticals, paints and others[16]. The majority of these programs are strictly waste management programs (i.e. they focus on ensuring waste from these product groups is managed appropriately at the end of the life cycle).[17]

Many of the provincial waste stewardship programs have been modeled after programs in other provinces; however, it is common to see programs that target the same product or packaging group managed differently from one province to another. Some provinces have elected to work together to ensure inter-jurisdictional harmonization. For example, the western provinces developed a regulatory

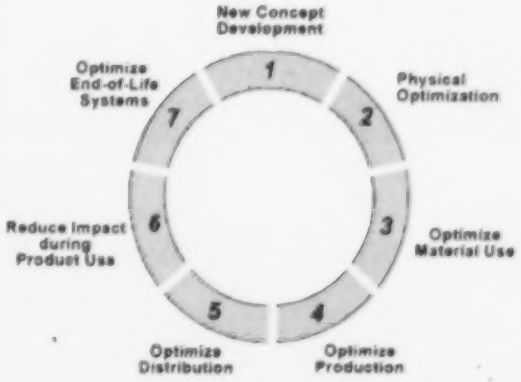
[16] Environment Canada Extended Producer Responsibility & Stewardship webpage: www.ec.gc.ca/epr/inventory/en/index.cfm

[17] The four criteria used to select the waste diversion stewardship programs that appear on the Canadian Inventory are 1) waste diversion is a program focus; 2) operates in the public domain; 3) funded in whole or part by industry and consumers; and 4) operates in association with federal, provincial or territorial government.

framework for their used oil programs under the belief that such harmonization may be helpful in ensuring consistent objectives and a level playing field, minimizing free riders, and simplifying the costs of participation for companies operating in more than one jurisdiction. BC's Product Care Program has also established an operations agreement with RRFB Nova Scotia to provide services on behalf of its members to the residents of Nova Scotia. Recognizing the need for more consistency in provincial approaches to waste stewardship and extended producer responsibility (EPR), the Canadian Council of Ministers of the Environment (CCME) has established some Canada-Wide Principles for Electronic Products Stewardship.

WHY DFE IS IMPORTANT

Leading governments and companies have long understood that the conceptual design stage is the most effective place to reduce the environmental impacts of a product system. This is because at the design stage, problems can be can be avoided at relatively low cost in comparison to solving problems like toxics in electronics once the production system is up and running. It is also the point at which innovation opportunities can be easily explored. Design for Environment (DfE) is a concept and a set of tools (e.g., environmental attribute checklists for product engineers, life cycle assessment, environmental performance questionnaires for component suppliers, expert redesign panels) that help industry improve the environmental performance of a product across its entire life cycle.[18] Design strategies that improve environmental performance include the selection of low impact materials, ensuring the use of "clean" production technologies, optimizing distribution systems, enhancing use phase attributes (e.g., product life time, resource consumption), and ensuring the product has minimal impact on the environment once it has reached the end of its use (e.g., through effective disassembly and recycling of the product). It is this latter design strategy that is of particular interest to the Government of Alberta in this study. Specifically, reducing the environmental impacts a product has once it is discarded, through product design that optimizes end-of-life performance. This strategy recognizes that a key to product stewardship is better design.



The Strategy Wheel

Effectively engaging industry to adopt these design strategies is a challenge as companies are typically focused on dimensions of their product system for which they measure direct benefits such as quality, cost, time to market, conventional customer demands, and profit margins. Also once the product is sold, problems generated by poor design often create no cost to the company that produces it. One key to successful DfE initiatives, whether initiated by industry or government, is to align DfE with internal and external business, market and regulatory drivers.

[18] Five Winds International worked with the National Research Council (Industrial Research Assistance Program) to create a DfE Guide. The Strategy Wheel was adapted from the Dutch Promise Manual, and can be found at www.nrc.ca/dfe/ehome/ehome.html

III. Objective and Methodology

Study Objective

The Government of Alberta would like to build on its long history of environmental stewardship by assessing design for environment (DfE) opportunities within its current Waste Stewardship Programs. The objective of the study was "to assess the alignment, relevance, opportunities and barriers to applying/ integrating design for environment and pollution prevention principles for each of the four programs: i) used oil and oil products, ii) non-milk beverage containers, iii) waste electronics and iv) scrap tires".

Methodology Used to Meet the Objective

To meet the Government of Alberta's objective, the work was divided into three phases:

- ***Phase 1: Understand Alberta's Current Waste Stewardship Programs*** – To ensure our project team had a clear understanding of the current policies and practices within the Delegated Administrative Organizations (DAOs), we interviewed three DAO Executive Directors and other relevant Government personnel. We also reviewed existing documentation on the waste stewardship initiatives and developed the criteria used in Phase 3 to assess the current effectiveness of Alberta's waste stewardship programs in stimulating DfE activities.
- ***Phase 2: Learn From Practices in Other Jurisdictions*** – We investigated the operation of, and outcomes from, programs in five leading public sector jurisdictions through interviews with government personnel, product producers and other experts. The review identified challenges, opportunities and lessons learned from their experience incorporating DfE principles and incentives.
- ***Phase 3: Gap Assessment and Summary Report*** – Based on the findings of Phase 1 and 2, we assessed the alignment of Alberta's current programs and their relevance to DfE, and investigated opportunities and barriers to promoting design for environment. We also reviewed the features of the other programs investigated and recommended actions the Government of Alberta could undertake to evolve its current waste stewardship programs into broader programs that stimulate DfE.

Study Limitations

The information and findings presented in this report should be interpreted with the following limitations in mind:

- ***The four Alberta stewardship programs assessed were developed to be strictly waste stewardship programs and not to promote DfE activities in industry***. This made it difficult to assess whether elements of each program (e.g., policy approach, incentives) hindered, had a neutral impact, or promoted DfE activities, as Alberta Environment had initially requested us to do. With no high-level policy objective it is not surprising DfE is not part of the policy approach or targets, a focus for the actors involved in the program, or a consideration when

designing program incentives. Instead, the Project Team elected to assess how the current programs aligned with criteria for effectively stimulating DfE, whether DfE was relevant to each program, and to identify any barriers and opportunities to incorporate DfE into each program.

- ***The scope of the study was limited***. Programs from only five public sector jurisdictions were reviewed and only five international experts were interviewed. It is therefore not an exhaustive study, and Alberta Environment is encouraged to undertake additional studies when moving forward with any recommendations.
- ***The concepts of producer responsibility and DfE continue to evolve and there is no simple or flawless model to adopt in order to achieve DfE results***. The variety of approaches, multiple drivers, and the differences between industrial sectors and product categories make it challenging to propose specific recommendations on a definitive policy approach. Therefore many of the recommendations for improvement are based on expert opinion gathered through interviews and that of our Project Team. It is recommended that the Government of Alberta consider each of the highlights provided from other jurisdictions, and then pick and choose what makes sense given their policy context.

IV. Which Jurisdictions Have Attempted to Incorporate DfE into their Waste Stewardship Programs?

There are three main approaches governments take to promote DfE in industry – a 'pull' or voluntary approach (e.g., informative or supportive programs, public procurement, voluntary agreements), a 'push' or regulatory approach (e.g., obligatory take back, material ban) or a combination of both. This study reviewed the practices of five public sector jurisdictions reflecting a range of these approaches. Interviews with international experts and managers of programs who have attempted to incorporate DfE into their stewardship programs demonstrate that it is still too early to draw conclusive evidence on which approach is *most* effective when it comes to promoting DfE among producers. The concepts of producer responsibility and DfE continue to evolve and there is no simple or flawless model to adopt in order to achieve DfE results.

Two of the programs reviewed report design changes in industry (UK WRAP and German Green Dot Program[19]), the European Commission's IPP Pilot Projects are still underway therefore it is still too early to measure results while Minnesota's Office of Environmental Assistance and Stewardship Ontario are still working to find the right policy levers to effectively promote DfE in electronics and packaging. Recognizing none of these five programs put forward a perfect model for promoting DfE, it is important to consider the lessons – *including successes and failures* – which can be drawn from each example.

Regulatory approaches are driving design changes in the electronics and electrical equipment industry in Europe. For example the Restrictions on Hazardous Substances Directive (RoHS) requires producers to substitute alternatives for mercury, hexavalent chromium and other heavy metals in certain applications. The Waste Electronic and Electrical Equipment (WEEE) Directive sets mandatory reuse and recycling targets of more than 65-75% depending on the product. Producers who want to sell products into the European marketplace must comply with these requirements.

[19] See Section IV: Which Jurisdictions Have Attempted to Incorporate DfE into their Waste Stewardship Programs.

Germany's Packaging Ordinance supported by the Green Dot Program has also driven design changes in beverage packaging in Germany and across Europe. Stewardship Ontario currently sets recycling targets for specific product categories and is looking to broaden the program to better stimulate design changes. Alternatively, the UK's Waste Minimisation and Resources Action Programme (WRAP) and US EPA's Design for Environment Program are voluntary programs that report design changes in industry.

STEWARDSHIP ONTARIO

Program Design and Goals - Ontario's Waste Diversion Act (WDA) requires all companies that introduce packaging and printed paper into Ontario's consumer marketplace ("Stewards") to share in paying 50% of the funding of Ontario's municipal Blue Box waste diversion programs. Stewardship Ontario was developed to meet the requirements of the Waste Diversion Act, and launched its program in February 2004. Stewardship Ontario is a multi-stakeholder body that acts as a connection between government and industry as the funding organization responsible for setting, financing and implementing a plan to meet the Provincial waste diversion requirements as set out in the WDA.

Part of Stewardship Ontario's policy is to change industry behaviour (i.e., promote DfE activities). Stewardship Ontario recognizes its current structure does not promote DfE and provides no real incentives for producers to redesign their packaging for better environmental performance. It has therefore planned to step up incentives for change through increased separation of material groups and assigning variable fees according to predetermined formulae.[20]

Results – Currently the only tangible example of DfE under Stewardship Ontario is the Liquor Control Board of Ontario (LCBO), the single highest payer of fees in Ontario. Costs became so high for the LCBO in the program they introduced new wine packaging (in the form of a tetrapak), complemented by an effective marketing campaign. Stewardship Ontario and the LCBO tout the success of this initiative as it has reduced their costs and the public reception has been positive.[21]

http://www.stewardshipontario.ca/

GERMANY'S GREEN DOT PROGRAM

Program Design and Goals – The German Packaging Ordinance, which came into force on 12 June 1991, is the legal basis for the work of Duales System Deutschland AG (DSD AG) and the Green Dot Program. The ordinance stipulates that used packaging must be recycled and that material-specific recycling targets must be fulfilled. In accordance with these statutory targets, DSD AG organizes the collection and sorting of used sales packaging as well as its transportation to the recycling plants. Trade and industry in their role as the producers of packaging waste arrange contracts with DSD AG which exempt them from their take-back and recycling obligation. They also pay licence fees for the right to use the Green Dot. DSD AG in turn enters into contracts with the waste management partners who are responsible for collecting and sorting the waste and forwarding it for recycling.

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[20] Personal Interview with Derek Stephenson, Program Managers of Stewardship Ontario. October 2005. Stephens referred to research conducted by Dr. Jack Minns, head of the CD Howe Institute. Research showed that differential fees are needed to stimulate design change.

[21] Personal Interview with Derek Stephenson, Program Manager of Stewardship Ontario. October 2005.

Duales System Deutschland AG gives companies an incentive to optimise packaging by way of the fees the licensees pay for the use of the Green Dot. Since the licence fees are determined by the packaging material and weight (i.e., they correspond to the costs for disposal and recovery that are actually incurred), the calculation is quite simple. If producers can save material, they do not have to pay as much.

Results – DSD AG reports packaging consumption per person in Germany has dropped from 96.8 kilograms in 1991 to 84.5 kilograms in 2003, a reduction of almost 13 percent. The design of sales packaging has also been modified in the last few years: refill packs and concentrates have replaced voluminous bottles, more products are sold without blister packs and secondary packaging made of cardboard or plastic has disappeared.[22] In addition to reported design changes, the organization PRO Europe is currently working with 24 countries interested in expanding the Green Dot scheme and applying it in their own regions.[23]

http://www.gruener-punkt.de/DER_GR_NE_PUNKT.50+B6Jkw9MQ__.0.html

UK Waste Minimisation and Resources Action Programme (WRAP)

Program Design and Goals – The WRAP Program was established in 2001 in response to the UK Government's *Waste Strategy 2000* to promote sustainable waste management, the EU Landfill Directive (the UK has a legal obligation to comply with the terms under this Directive), and to help meet recycling targets under Packaging Regulations. WRAP recognized increases in recycling rates and composting would help the UK comply with the directive; however, it also felt a combination of sustainable design practice and waste management thinking was necessary to effectively address sustainable consumption and production issues in the country. To achieve its goals, the Government's strategy is to tackle the problem at a number of levels:

- Increasing local authority statutory recycling and composting targets;
- Raising recycling targets under packaging regulations;
- Increasing costs of landfill use through a Landfill Tax escalator;
- Installing new capacity to treat residual waste to render it inert so that it no longer counts toward the Landfill Directive Targets;
- Reducing the packaging of household waste by consumers, particularly the amount of packaging and food they throw away.

WRAP research showed 35-40% of household waste that ends up in a landfill began its life as a purchase from the top 5 retail supermarkets. In response they launched "the Retailer Initiative", a program of activities aimed specifically at helping the retailed sector to identify opportunities for more sustainable product design that facilitates both waste minimization and cost reduction. WRAP provides incentives for retailers to participate in the form of technical support, best in class data, help conducting research, and funding for R&D, demonstration and trial projects through its £8 Million Waste Minimisation Innovation Fund. Thirteen top retailers have signed on to WRAPs *Courtauld Commitment* to design out packaging waste growth by 2008 and deliver absolute reductions in packaging waste by March 2010.

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[22] Green Dot website. http://www.gruener-punkt.de/DER_GR_NE_PUNKT.50+B6Jkw9MQ__.0.html

[23] Personal Interview with Derek Stephenson, Program Manager of Stewardship Ontario. October 2005.

Results – Results reported to date include a variety of innovative supply chain partnerships including one with Sprout Design and Tesco to design out waste from ready-meal packaging, Pira International and Altair Engineering to optimize material use in rigid plastic packaging, and ASDA, Kane Salads and Eco 3 to down-gauge the film in salad bags from 35 microns to 30 micron film[24].

http://www.wrap.org.uk/waste_minimisation/retailer_initiative_innovation_fund/

MINNESOTA'S ELECTRONICS STEWARDSHIP PROGRAM

Program Design and Goals – In 1999, electronic waste was identified by Minnesota's Office of Environmental Assistance (MOEA) as one of three priorities for its Product Stewardship Program (specifically CRT monitors/TVs). Since 1999, the MOEA has pursued different approaches – from voluntary to regulatory measures – to make progress on this priority. To date the MOEA is still working to enact its electronics Product Stewardship Program.

Results – In late 2001, a voluntary program was brought in but producers did not support it, as they were concerned about the lack of level playing field among US and overseas producers. The MOEA has been trying to pass a bill to enact regulations since 1992 but has faced many hurdles. Lobbying has been intense as the industry is split on the issue. Some producers want individual responsibility with no fees while others are calling for collective responsibility with general fees. The MOEA attempts to stay up to date on developments internationally and in other states (currently three states have enacted regulations including California, Maryland and Maine and more are considering legislation including Oregon, Wisconsin, Washington, and Massachusetts) trying to adopt a CRT ban and promote green public procurement as complementary efforts[25].

The MOEA has had more success with its carpet stewardship program. On January 8, 2002, the Memorandum of Understanding for Carpet Stewardship (MOU) was signed. This voluntary agreement established an ambitious ten-year schedule to increase the amount of reuse and recycling of post-consumer carpet and reduce the amount of waste carpet going to landfills. The MOU is the result of a two-year negotiation process between members of the carpet industry, representatives of government agencies at the federal, state and local levels, and non-governmental organizations. The carpet industry has established a third-party organization known as the Carpet America Recovery Effort (CARE) to achieve the national goals for reuse and recycling of discarded carpet.

http://www.moea.state.mn.us/stewardship/electronics.cfm

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[24] Personal Interview with Mark Barthel, Special Adviser, Waste & Resources Action Programme, Retail Innovation Team October 2005.

[25] Personal Interview with Garth Hickle, Product Stewardship Team Leader, Minnesota Office of Environmental Assistance. October 2005.

EUROPEAN UNION INTEGRATED PRODUCT POLICY (IPP) PILOT PROJECTS

Program Design and Goals – In 2001, the European Commission released a green paper on IPP, and in 2003 a White Paper was released which was adopted by the European Commission and the Parliament.

Consultation with the Member States identified that practical guidance was needed on "how to roll out IPP – what is it, what is the methodology, how does it work." Among several initiatives, the European Commission decided to launch the IPP pilot project exercise as a means of demonstrating how IPP can work in practice. The pilot projects were based on product panels used in Denmark and the Netherlands. One of the main goals of the IPP pilot projects was to bring multiple stakeholders from along the entire product chain to the table to identify significant environmental impacts and improvement options through redesign.

There were no financial incentives to attract companies to participate in the IPP Projects, however all who submitted proposals had good reasons for wanting to be involved.[26] As a leader, Nokia wanted to approach government before government approached them (i.e., with legislation). They wanted to come to the table to be able to influence policy.[27] Carrefour wanted to be involved as they recognized a hole in their sustainability strategy. The market (i.e., consumer) was not yet demanding greener products and Carrefour wanted help with marketing efforts, and raise its profile as a more sustainable product producer.

Results – The first set of pilot projects are still underway therefore it is too early to report on results. However, the Program has been successful at achieving its primary goals of bringing multiple stakeholders together (in a product panel format) to identify more sustainable solutions and to create two successful stories that can be used to demonstrate to European Member States how the IPP methodology can be practically applied.

The European Commission's Definition of Integrated Product Policy (IPP)

IPP represents a new approach to environmental protection in Europe and puts emphasis on three dimensions:

- **Life-cycle thinking** - when pollution-reduction measures are identified, consideration is given to the whole product lifecycle. This avoids shifting the environmental impacts from one phase of the lifecycle to another and reduces the overall environmental impact.
- **Flexibility** – Many different policy measures influence the environmental impacts of products such as taxes, product standards and labelling, and voluntary agreements. Given the wide variety in products it makes no sense to prefer any one type of instrument.
- **Full stakeholder involvement** – Throughout their long and complex lives, the environmental impacts of products are affected by the actions of many different stakeholders, such as designers, industry, marketing people, retailers and consumers. Reducing these impacts requires all stakeholders to take action in their sphere of influence: for example, manufacturers on the design and marketing of products, and consumers through product choices, use and disposal habits.

European Commission
europa.eu.int/comm/environment/ipp/home.htm

http://europa.eu.int/comm/environment/ipp/pilot.htm

More information on each program can be obtained by contacting the individual listed in Appendix 4 and 6, or by visiting the program websites.

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[26] Personal Interview with Bengt Davidsson, European Commission. October 2005.
[27] Presentation at Product Sustainability Round Table Meeting in Rome Italy, April 2005. Salla Ahonen. Nokia.

COMMON CHALLENGES WHEN PROMOTING DfE IN INDUSTRY

Public sector jurisdictions can face a number of challenges when trying to promote DfE practices in industry. International experts and program managers interviewed in this study noted the following common challenges[28]. Alberta Environment may or may not face these in each of the product waste streams it currently manages; however, the study team felt they were important for Alberta Environment to be aware of as it moves forward.

Ability to influence the market – Many provincial governments in Canada believe it is hard to stimulate an entire industry value chain given the limited influence of a small market.[29] Many question why a company would redesign its product to meet more stringent requirements in one jurisdiction when it only accounts for a very small percentage of its sales. The relatively small size of a Provincial or Canadian market for products increasingly designed for continental or global markets also poses a barrier, especially when many products are designed outside of Canada. Others noted Provinces are limited in their legal authority to force producers to meet certain requirements if they exist outside of the Province and must often resort to regulating first sellers.[30]

Five interviewees noted Europe and California have had more success promoting DfE as they are more sizable markets with the power to leverage industry. Some interviewees pointed to the need for the Provinces to work together in a more collaborative manner to come up with national programs that offer some consistency and credibility to industry, and provide more of an influence as a larger market. It was suggested each province send a signal that DfE is a policy objective, and then work with other jurisdictions to come up with a common approach. If the Provinces took a united approach, industry would have less success lobbying each province individually.

However, three participants indicated progress on a national level has been slow (i.e., lots of discussions going on around waste electronics in EPSC and EPID however little action is taking place) and that provinces cannot always wait for a cohesive national approach in order to move forward. Throughout history, producers have had to make products and packaging to meet different safety and environmental requirements of the markets they sell to, therefore there is evidence producers are capable of making these changes for smaller markets. It was also suggested that provinces could adopt similar requirements to those of other jurisdictions who have already taken a certain approach. If the companies have already had to respond to requirements of one region (Japan's Top Runner Approach, Europe's RoHS or Energy Using Products Directives, Maine's Producer Responsibility Regulation on electronics), they will be capable of responding to the same requirements in other regions. In some product categories, a lack of domestic producers to work closely within program design and operation can also hamper progress.

Working together with other provinces – Interviewees noted that at a given time, each provincial government has different priorities in their environment program and limited funding for those priorities. Devoting time and resources to collaborate with other provinces on a DfE program focused on a particular waste stream of common interest can be a challenge. Priorities can also change quickly in government as governing authorities come and go.

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[28] These challenges were not mentioned by interviewees as specific to Alberta. Rather they are common challenges various regional governments may face when attempting to promote DfE.

[29] Personal Interview with Brian Grant, BC Ministry of the Environment, Derek Stephenson, Stewardship Ontario, Dennis Hambleton (AUOMA), Bob Saari, BCMB.

[30] Personal Interviews with Derek Stephenson, Stewardship Ontario. October 2005. Challenge was also noted by Alberta Environment in comments on Draft Report.

Moving from collective systems to individual responsibility – Governments tend to adopt collective systems where all producers pay into one pot to manage the waste associated with a certain product group. The terms of collective systems are often easier to negotiate among all the players and are also easier to administer and monitor, however there is rarely an incentive for DfE in a collective system. In many product categories there is a divide in the industry itself with some calling for individual responsibility while others call for collective responsibility. To establish an individual responsibility model that includes incentives for DfE, interviewees felt a cross-province approach is important. It sends a clear message to industry and may make it easier to provide clear and consistent incentives for producers to improve the environmental performance of their products. Recognizing that working together with other provinces has been a challenge in the past, many interviewees noted it is still important to enhance consistency as much as possible across provinces (i.e., with material bans, take back laws, etc.).

Providing tangible incentives for producers – Applying taxes, charges or fees based on product or material types and other environmentally preferable attributes is a difficult task. Introducing new taxes can be an unpopular with some industry sectors, and internalizing external costs is a relatively new undertaking for industry and government. Governments have also come under fire for showing preferential treatment to one industry over another, which makes them reluctant to adopt taxes and charges for a specific product or packaging category. Because of industry lobbying, selecting tangible incentives that will effectively stimulate DfE can become extremely political. It can also be technically challenging to establish variable fees or charges (i.e., quantifying an environmentally preferable material, determining how many products from a certain brand were sold into Alberta, figuring out how to separate one brand or model from another etc.). In some product categories (e.g., electronics) it is difficult to separate different brands and models of equipment, as they all look quite similar. Using radio frequency identification (RFID) is one technology that may assist governments in this challenge. In addition, governments implementing programs to promote DfE in the electronics sector and for other products with rapid innovation cycles need to be cognizant of putting incentives in place that restrict innovation.

Lack of skills and resources – Effectively promoting DfE requires a product-focused policy approach emphasizing the entire life cycle of products (cradle-to-grave impacts) as opposed to a waste management focus. Life cycle thinking is a relatively new way of thinking for many governments and requires a different set of skills and information. Governments often struggle with setting 'smart' legislation that results in overall improved sustainability performance without having technical expertise in every product or packaging category. Governments want to do the right thing and adopt programs that contribute to positive environmental improvements but do not have all the insights necessary to know where there are significant environmental or social impacts and how to address them. Industry also calls on government to select priority products or packaging categories, as they need help focusing their R&D efforts. Setting priorities can be complicated by the lack of a clear vision at the regional or national level. Many interviewees suggested the use of product panels as a mechanism to help overcome the potential lack of skills and resources. Involving a broad group of stakeholders including industry, NGO and academic representatives will help everyone involved to reach a high level of understanding of the real issues across the life cycle, and to identify solutions to manage them accordingly. Developing, or contributing to, publicly accessible national or international databases of life cycle information can also help to overcome this challenge.

Lack of direct customer demand – There is not always a clear market driver or business case for producers to do DfE. Producers are more likely to go with the lowest cost option and supply whatever consumers are demanding. Without a demand for greener or more sustainable products, producers are less likely to put those types of products on the market. Government can do more to educate

consumers about making more sustainable choices at the point of purchase and set a leadership example with their own public procurement. The reluctance to make a commitment to sustainable purchasing was noted by three interviewees as a barrier. Government needs to make a long-term internal commitment to sustainable purchasing and then provide the resources necessary to develop skills in life cycle management and total costing, and to cover premiums on more sustainable products. Collaborating with other governments (at a provincial or national level) to develop a consistent procurement strategy and to educate consumers will enhance overall customer demand.

Producers' lack of trust in government – It can be challenging to get industry to see government-led regulatory or voluntary programs as an opportunity instead of threat.[31] Involving actors from across the value chain early in the development of the program was suggested as a way to overcome this issue with regulatory programs (i.e., product panel). On the voluntary side, some governments have tried to position themselves as a center of excellence who help companies find solutions and realize technical innovations (e.g., UK WRAP Program, US EPA DfE Program). Three interviewees noted governments should provide subsidies or R&D funding to producers who are serious about making design changes to their products but need to alter their processes, tooling or pay a premium for alternative materials. This was mentioned in the context of SMEs as well as larger companies.

V. Gap Assessment

Criteria for Effectively Stimulating DfE

In collaboration with Alberta Environment, the Project Team developed the following criteria to assess the alignment of Alberta's current waste stewardship programs with effective stimulation of DfE activities in industry. The criteria are adapted from OECD's principles for effective EPR programs and also informed by our experience with other stewardship and DfE programs.

Criteria for effectively stimulating DfE and increased product stewardship activity include:[32]

i. Policy or clear statement of intent to promote design change which will improve environmental outcomes across the life cycle;

ii. Flexible policy approach that focuses on results rather than means of achieving them;

iii. Incentives for producers to increase its share of responsibility for managing its product throughout the life cycle of the product (physically and/or economically, fully or partially) and take environmental performance considerations into account upstream at the design phase;

iv. Incentives for consumers to choose products or packaging with better environmental performance over the life cycle;

v. Involvement of actors along the product value chain (or life cycle) including suppliers, customers, public consumers and other stakeholders in the development of, and periodic evaluations of, stewardship programs that incorporate DfE as a policy objective;

vi. Feasible for government to manage/enforce; and

[31] Personal Interview with Mark Barthel, Director UKs WRAP Program. October 2005.

[32] This list of criteria was approved by Alberta Environment prior to the assessment. List does not imply any order of importance.

vii. Continual improvement is implicit in program design through establishing baselines, setting targets related to DfE, ongoing monitoring and reporting mechanisms.

GAP ASSESSMENT RESULTS

It is important when reviewing the gap assessment results to understand the study objective was not to assess the overall success and effectiveness of Alberta's four Waste Stewardship Programs. The purpose of the assessment was to assess how the current programs are ***aligned*** with criteria for effectively stimulating DfE, whether DfE is ***relevant*** to each program or product group, and to identify any barriers and ***opportunities*** to promoting DfE in each sector.

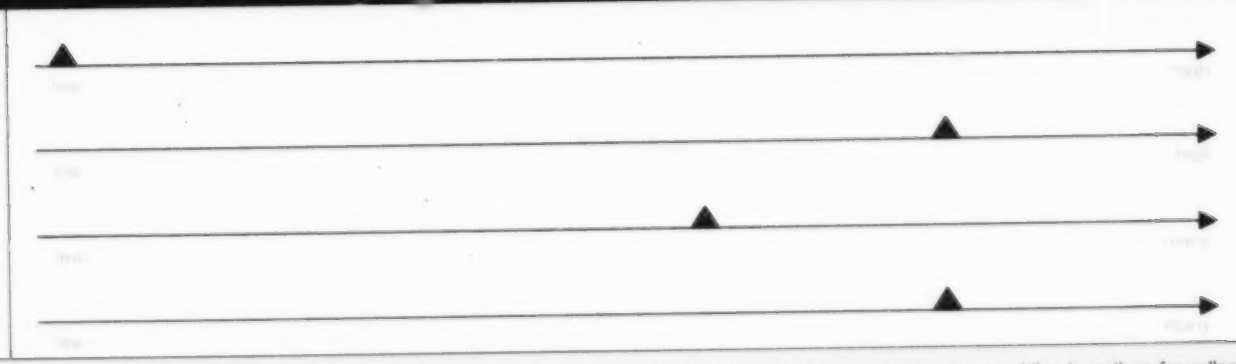
Not aligned with DfE – As anticipated, the gap assessment clearly identified that each of the four waste stewardship programs is poorly aligned with DfE. None of the existing programs include DfE as a policy objective, nor is it a focus of program delivery, target setting or the review and evaluation process. The lack of incentives for producers to take environmental factors into account at the design stage is also apparent in each of the four waste stewardship programs.

Electronics and beverage containers are most relevant – DfE is most relevant to the electronics recycling program and beverage container recycling program. Rapid innovation cycles and the use of multiple materials in these products means there are considerable opportunities to take environmental performance improvements into account in the design phase. With products such as tires and used oil there are fewer opportunities, however, it is still important to set DfE as one of the long term guiding policy objectives, to promote innovation and alternative technology developments. For these products, DfE opportunities may be possible at other stages of the life cycle (e.g., recycling technology for tires and recovery strategies for waste oil).

Direction for existing programs – During interviews, Executive Directors from each of the DAOs explained the programs were not designed to incorporate DfE. The focus of each program is on how to best recover and recycle the material streams from discarded products. It was clear however, that each program is committed to continual improvement, and the Executive Directors are willing to consider adopting new practices that prevent pollution and waste, and promote DfE activities among industry if that is the direction Alberta Environment would like to head in. Efforts in this regard would be greatly supported by a policy direction that includes DfE as a long-term objective, supporting tools, direction on which DfE approaches make sense for their specific product or packaging, and a better understanding of the potential roles and responsibilities of the relevant industry players along the product systems.

Specific recommendations for each waste stewardship program can be found in the following tables.

Assessment Summary: Beverage Containers [33]



Alignment – The policy and objectives of Alberta's current Beverage Container Recycling Program are focused strictly on end of life management – providing incentives for collecting used beverage containers and managing them in an environmentally responsible manner. Therefore, by design, this stewardship program is poorly aligned with DfE. There is no program incentive for introducing packaging designs with lower environmental impacts.

Relevance – Beverage packaging is an extremely relevant category for DfE. The innovation cycle is rapid, packaging changes frequently to capture marketing attention, and there are many different types of materials and packaging solutions. As such there are considerable opportunities to promote or reward packaging materials that are more easily recycled, packaging that is smaller or lighter or packaging with fewer impacts over the life cycle (i.e., certain biobased packaging). Many jurisdictions have targeted beverage and other packaging as a significant household waste issue.

> ***UK WRAP*** decided to focus on all food and beverage packaging as it contributes significantly to the amount of landfill waste each household produces.
> ***The Green Dot Program and Stewardship Ontario*** also decided to focus on all types of packaging as it constitutes a significant percentage of household waste.
> ***At least nine other Provinces and Territories*** have targeted beverage container packaging as an end of life waste management issue although none have significantly promoted new packaging designs.

Barriers – There are no direct rewards in Alberta's program for producers who design lightweight or easier to recycle containers, who collect and reuse/recycle their own materials or otherwise invest in innovative packaging solutions with improved environmental performance along the life cycle in the current program. Although the program has incorporated variable container recycling fees, producers have little direct incentive to manufacture more environmentally preferable packaging as these fees are passed along to the consumer. While consumers pay a differential fee depending on the recyclability of the packaging material, it was not introduced to significantly influence purchasing behaviour. It was introduced to cover the costs of recycling. In some cases this fee is not even disclosed to consumers and no information is provided to consumers on the environmental impacts related to various types of packaging[34]. Without incorporating an incentive for both producers and consumers to select environmentally preferable packaging materials, opportunities for DfE will be limited.

> ***Stewardship Ontario*** noted it intends to move in the direction of differential fees, similar to variable fees used by the **Green Dot Program**, as it recognizes there are currently no incentives for DfE in the current collective system.

[33] The figure provided to illustrate the assessment summary for Beverage Containers is based on personal judgements of the Project Team and not on mathematical calculations.
[34] Personal Interview with Bob Saari, BCMB. October 2005. Bob indicated there is no recycling fee for aluminum due to high scrap value, therefore if consumers buy aluminum beverage cans they avoid the recycling fee but there is nothing to promote this aspect to the consumer. These incentives have not been formalized in the current program.

Assessment Summary: Beverage Containers [33]

Opportunities for promoting DfE – Based on the review of Alberta's current program and the review of other jurisdictions, several opportunities to improve the promotion of DfE for beverage containers were identified.

Recommendation	When	Who	Examples	Benefits/ Challenges	Resource Investment
1 ***Stipulate DfE as a policy objective for Beverage Container Stewardship Program*** Expand existing policy objectives to include DfE, focus on waste prevention and reducing life cycle impacts of packaging. *BCMBs existing policy objectives* 1. Maximize the recovery of regulated beverage containers; 2. Be accountable for the beverage container management system; 3. Improve the level of public satisfaction; 4. Improve the effectiveness of the system; 5. Minimize the impact of beverage containers on the environment.	Short-term	AB ENV	*Germany's Green Dot Packaging Legislation* • Legislation sets a clear hierarchy for handling packaging waste. The first and foremost policy objective emphasizing DfE is "packaging waste must be prevented or reduced" *UK WRAP Program* • WRAP was developed to meet EU Landfill Directive and includes five policy objectives; one is focused on DfE, to "Reduce the production of household waste by consumers, particularly the amount of packaging and food they throw away" *MOEA product stewardship policy:* • Ensure all involved in producing, selling and using of products are responsible for the full environmental impact of the product • Provide direction to producers to examine products from a life cycle perspective • Reduce or eliminate the amount and toxicity of waste from products and use materials, energy and water efficiently at every stage of a product's life • Incorporate cost of end of life into the cost of producing a product so that producers and users are paying up front for proper management of waste products. This provides incentives for making end of life management cheaper by making changes in product design *European Commission Integrated Product Policy*	*Benefits* • Communicates government's intention to reduce role in managing (and paying for) waste and increase role in stimulating waste prevention • Facilitates improvement of overall environmental outcomes, not just waste management • Allows for setting of meaningful targets beyond waste management targets • Gives DAOs the support needed to integrate DfE incentives, utilize mechanisms to penalize non-complying companies, etc. • In the absence of a high level policy commitment on DfE, it is unlikely any progress will be made towards targets on waste prevention and life cycle impact of products	Low

			(reflected in IPP Pilot Projects, EuP Directive) • Integrated Product Policy seeks to minimize environmental degradation by looking at all phases of the life cycle and taking action in the design phase where it is most effective		
2 ***Formalize incentive for producers to redesign beverage container packaging for improved environmental performance*** There are capabilities in the current program (through existing variable fee structure) to provide incentives to producers to manufacture, and consumers to choose, packaging with improved environmental performance along the life cycle. These could be formalized if producers internalized the actual costs of managing the material, or if there was a communication campaign designed to educate, and influence consumers to purchase environmentally preferable packaging materials, or combination of both. *Producer Incentives* If producers had to cover the costs of managing their packaging materials at end of life (instead of passing these along to the consumer) they would be more inclined to consider DfE (e.g., Green Dot Program). Alberta should consider whether the current formulae used to determine its variable container recycling fees are comprehensive and encourage improved environmental performance across the life cycle. *Consumer Incentives* If consumers were provided with the appropriate information (environmental attributes on each type of packaging), they would be able to choose	Short-term	AB ENV	*Germany's Green Dot Program* • The Green Dot scheme places direct financial responsibility for recycling or disposing of packaging on producers • The fee fluctuates with the amount and type of packaging material *and* corresponds to the costs for disposal and recovery that are actually incurred. Additional packaging means additional waste management obligations and thus additional costs for producers • Producers opting for low-waste and recyclable packaging save energy and raw materials and therefore pay lower fees *Stewardship Ontario* • Plans to introduce differential fees based on material type and weight to create incentives for design changes to improve and reduce packaging *UK WRAP* • Signatories commit to supporting WRAP in achieving its objectives (Courtauld Commitment) • WRAP provides retailers, brand owners and suppliers with technical support and "best in class" data on reducing packaging weight (subsequently reducing production and transport costs). WRAP makes its research available to the retail sector	*Benefits* • Design changes, or introduction of different packaging solutions to the Alberta market, by supporting design solutions with lower environmental impacts • Generate funds from most costly packaging, to cover waste management, consumer education, DfE support (e.g., small enterprises) • The German Green Dot Program and UK WRAP program both report design changes due to their incentives. (e.g., Germany reports packaging consumption per person dropped 13% between 1991 and 2003, while the design of sales packaging has been modified (refill packs, concentrates, less secondary packaging) *Challenges* • Determining different fees for different materials and packaging systems (selecting boundaries, to include or exclude manufacturing, storage and distribution), and keeping those up-to-date – Suggest building on experience of others • Companies may debate back and forth about their materials, making arguments for why one is better than	Med – high A lot can be learned from others who have established variable fee systems, which would reduce the admin burden. If developing a voluntary program, need to allocate a significant amount of resources (staff and funding).

[35] Personal Interview with Derek Stephenson, Program Manager Stewardship Ontario. October 2005.

Assessment Summary: Beverage Containers [33]

environmentally preferable products. Their purchasing decisions would reward producers who manufacture environmentally preferable packaging. Each of these actions is dependent on having a policy that specifies DfE *as an intended outcome* and explains the reasoning behind the variable fees. The fee is currently not designed, or intended, to promote DfE. *Learn from others* Alberta should learn more about the direct incentives incorporated by the German Green Dot Program and work closely with Stewardship Ontario as it strives to incorporate incentives for DfE in its current program. Alberta should also consider the voluntary approach taken by the UK WRAP Program (through its Courtauld Commitment).			• WRAP funds retailer-led or brand-led research and development, trials and demonstration projects to mitigate risks associated with introducing new products or packaging concepts (via Innovation Fund of £8 million, or $16 million CAD)	another (multi-stakeholder panel of actors from across the life cycle may help to overcome this challenge)[35] • Ensuring trade barriers are not created with a variable fee system under current trade agreements • Securing funding for a longer term industry support program (e.g., UK WRAP Program Innovation Fund is £8 million) • Securing industry support with both regulatory approaches and voluntary approaches. See Discussion *Section VI: Detailed Study Findings, Policy Approach*	
3 ***Develop national strategies for beverage packaging, as there are significant opportunities for environmental performance improvements through redesign*** As many provinces have selected beverage packaging as a focus, it makes sense to put forward a more consistent, national approach. Alberta Environment should also consider expanding program to include other packaging types as Ontario, Germany and UK have done.	Short-long term	With other prov's or CCME	*PRO Europe / Green Dot* • PRO Europe is currently working with 24 countries interested in expanding the Green Dot scheme and applying it in their own regions *WEEE, RoHS, EuP Directives in the European Commission* • All European Member States must comply with requirements outlined in each of these Directives creating a larger, single market	*Benefits* • Create a sizable market opportunity for products with better environmental performance • Send a common signal to industry that government is serious about getting out of the business of managing waste • Improve efficiency as provincial managers can pool their resources and expertise in design and operation of each program (such as determining material-type and weight-based fees) • A common approach may help ensure environmental solutions do not impose unfair barriers to trade. In its inception, the German packaging law received such criticisms (foreign firms claimed it would be time consuming and expensive to	High

Assessment Summary: Beverage Containers [1]

				establish collection systems, sort and appropriately handle packaging as the law required. Small exporters claimed it would be difficult to take back and recycle small quantities of packaging) *Challenges* • Each province's current approach is slightly different, will pose some challenges in determining which approach is more effective and better suited to promoting DfE with incorporation of some incentives • Provinces have not worked well together in the past (environment not a priority, lack of clear provincial, federal direction etc.)

Assessment Summary: Tires[36]

Alignment – The policy and objectives of Alberta's Tire Recycling Program are focused strictly on end of life management. Producers have no responsibilities in the Program. ARMA has elected to focus on providing incentives for collecting used tires and managing them in an environmentally responsible manner, instead of DfE.

Relevance – There are fewer opportunities for DfE with a product category like tires. It is still however somewhat relevant, and important to indicate DfE as a long-term policy objective to ensure innovation and alternative technology developments are not hindered. Immediate opportunities for environmental improvement of tires appear to be in collection, recycling technology and developing secondary markets, and less in redesign of the tire, making it challenging to create design incentives[37]. Within the current program, ARMA has the ability to fund new research and development in these areas.

> **The UK's WRAP program** innovation funding provides incentives for tire producers to investigate environmental design options and end-of-life management practices.

Barriers – Producers are not involved in the program therefore they have no direct incentives for DfE or to close their own product loop. Alberta has found they have no legal authority to force producers to participate if they exist outside of the Province of Alberta. Alberta Environment therefore is limited in regulating first sellers of tires. There are no targets associated with DfE.

Opportunities for promoting DfE - Based on the review of the existing program and the review of other jurisdictions, few opportunities to promote DfE were identified.

[36] The figure provided to illustrate the assessment summary for Tires is based on personal judgements of the Project Team and not on mathematical calculations.
[37] Personal Interview with Mark Barthel, Director UK WRAP Program. October 2005.

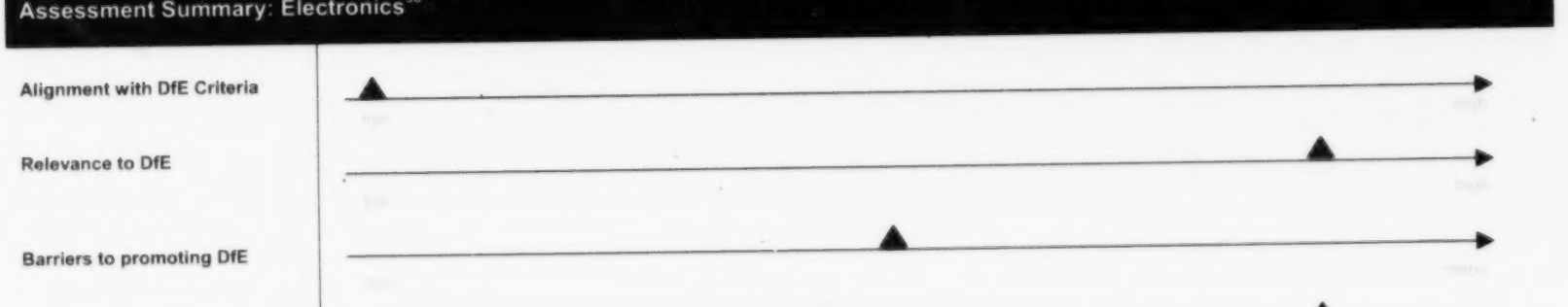
Assessment Summary: Tires[36]

Recommendation	When	Who	Examples	Benefits & Challenges	Resource Investment
1 ***Stipulate DfE as a policy objective for Tire Stewardship Program*** Expand existing policy objectives to include DfE, focus on waste prevention and reducing life cycle impacts of tires, in addition to current objectives for optimising waste management. *TRAs existing policy objectives:* 1. Enable waste minimization and recycling solutions for all eligible scrap tires discarded by Albertans. 2. Scrap tires are recycled in an environmentally and socially responsible manner. 3. Scrap tire recycling is economically viable. 4. Albertans are aware of and support tire recycling. 5. Alberta communities benefit from tire recycling.	Short-term	AB ENV	*See example policy objectives from other jurisdictions promoting DfE from Beverage Container Table.*	*Benefits* • Facilitates improvement of overall environmental outcomes for tires, not only waste management • Enables some balance between finding markets for recovered tire material and prevention • The policy statement should be realistic about limited redesign opportunities for tires, reflecting a long term commitment to improve the way tires are managed across the life cycle, which includes a focus on design *Challenges* • Interest and participation of producers (decision-makers) may remain low	Low
2 ***Determine a DfE related focus or target for the Tire Stewardship Program*** To support consideration of solutions beyond waste management for tires. Examples could include: • Setting a target to allocate a certain amount of R&D funding (under existing R&D Program or new program) for research into tire development that incorporates a greater amount of	Medium term	AB ENV with mnfctrs, academia, trade ass, or research orgs	*UK WRAP* • WRAP funds retailer-led or brand-led research and development, trials and demonstration projects to mitigate risks associated with introducing new products or packaging concepts (via Innovation Fund of £8 million, or $16 million CAD) • Could be applied to R&D Projects with tires *US EPA DfE Program*	*Benefits* • Supports policy objective (demonstrates AB Env is interested and will support any DfE opportunities that arise over the long term) • Facilitates improvement of overall environmental outcomes for tires, not only waste management • Strives to bring all relevant stakeholders (actors along the value chain) together to identify issues and	Low effort, Medium cost

Assessment Summary: Tires[36]

recycled content, extends useful life, or other life cycle performance improvements • Arranging an R&D projects that involves tire producers and other actors from across the value chain as their involvement will help to identify opportunities to reduce the impact of tires over the life cycle			• The EPA DfE Program targets industry sectors that face sustainability challenges • In some cases, the EPA approaches an industry sector or association with ideas about what can be done to make performance improvements while in other cases, companies approach program staff with project ideas • Since 1992, the DfE Program has worked with more than 18 industrial sectors to empower industry to incorporate environmental considerations, along with performance and cost considerations, into the product development process (through ecodesign) *IPP Pilot Projects* • In the EU, two pilot projects demonstrate an effective model for engaging industry, consumers and other experts to propose environmental improvements across the life cycle of a product • For tires, a panel could investigate issues arising from raw materials, manufacturing, transportation, distribution, storage, use and discard as well as value of customer education on life cycle environmental impacts, and use to promote long life	potential solutions *Challenges* • Soliciting interest and participation of producers however there are incentives (through R&D funding) and less risk (as AB ENV is not setting new regulation) • Alberta has found they have no legal authority to force producers to participate if they exist outside of the Province of Alberta. Alberta Environment therefore is limited in regulating first sellers of tires • Securing R&D or innovation funding • It can be challenging to get industry to see government- led voluntary programs as an opportunity instead of threat. To overcome this, some governments have tried to position themselves as a center of excellence who help companies find solutions and realize technical innovations (UK WRAP Program, US EPA DfE Program)

Assessment Summary: Electronics[38]



Alignment – The policy and objectives of the Electronics Recycling Program are focused strictly on end of life management. Producers have few responsibilities in the Program other than to participate in, and provide input via the Industry Council, to the Board. ARMA has elected to focus on providing incentives for collecting electronics and managing them in an environmentally responsible manner instead of DfE.

Relevance – DfE is extremely relevant for electronics because of rapid innovation cycles, marketing strategies that include planned obsolescence, desire to better manage substances of concern such as heavy metals and brominated flame retardants, and potential recovery of valuable components and materials at end of life. Many jurisdictions have developed regulations and voluntary programs focused on reducing the environmental impact of electronics across the life cycle through redesign activities.

European Commission has enacted several Directives focusing on electronic and electrical equipment including the WEEE, RoHS and EuP Directives.
States of Maine, California and Maryland have all adopted regulations on electronic waste, and many more are considering regulations (Oregon, Wisconsin, Washington, and Massachusetts). The State of Minnesota is also trying to enact a CRT landfill ban.
Japan's Law Concerning Rational Use of Energy and its "Top Runner Approach" – Producers of electrical equipment in Japan are required under law to improve the energy efficiency of their products and equipment over time.
EPSC, NEPSI, Minnesota voluntary initiatives – Canada, the US and the State of Minnesota have all tried to adopt voluntary take back and recycling programs for electronics (all with little success).

Barriers – Producers do not currently take on physical or financial responsibilities for managing their products or packaging at end of life as part of the program. Some concern was expressed over the fact that Alberta feels it has very little leverage on the global electronics market, especially when many electronics producers are located off shore. Concern was also expressed in regard to technical methods of separating electronics by brand (in order to enable interested producers to take back and reuse or recycle their own products). Currently consumers pay for the costs of recycling. Fees range depending on type of electronics ($5 to $45) but there is no difference between make and models, and therefore no financial or informational incentives for consumers to select products with improved environmental performance.

National implementation of the WEEE Directive Hungary put regulations into force in August 2005 (via Decree 264/2004) to implement the WEEE directive in

[38] The figure provided to illustrate the assessment summary for Electronics is based on personal judgements of the Project Team and not on mathematical calculations.

Assessment Summary: Electronics[38]

national law. They are not alone and as countries follow suit, product producers are responding with products and collection systems that meet the set environmental performance criteria. Alberta, therefore, may not need to leverage the market, but only implement program incentives that reward manufactures and consumers who create and purchase products with less impact (ranging from recoverability, recyclability, durability, hazardous substance content or dispersion). The Hungarian Decree sets take-back and collection obligations for distributors and producers (both collective and individual systems are allowed). It requires producers inform consumers of associated environmental issues. And it requires producers report on methods used to reach collection and recovery targets. Hungary's Environmental Authority can impose waste management fines on distributors, producers or recyclers not fulfilling their obligations. The fines are considered "public dues."[39]

Opportunities for promoting DfE – Based on the review of the existing program and the review of other jurisdictions, several opportunities to improve the promotion of DfE were identified.

Recommendation	When	Who	Examples	Benefits & Challenges	Resource Investment
1 ***Stipulate DfE as a policy objective for Electronics Stewardship Program*** Expand existing policy objectives to include DfE, focus on waste prevention and reducing life cycle impacts of electronics, in addition to current objectives for optimising waste management. *ERAs existing policy objectives:* 1. Enable waste minimization and recycling solutions for all eligible electronics discarded by Albertans. 2. Eligible electronics are recycled in an environmentally and socially responsible manner. 3. Electronics recycling is economically viable. 4. Albertans are aware of and support electronics recycling. 5. The list of eligible electronics is reviewed at least annually, consistent with the Regulation. Indicating prevention of waste and dispersion of certain heavy metals (e.g., mercury, hexavalent chromium, lead) are key policy objectives.	Short term	AB ENV	*State of Maine E-Waste Law*[40] • Establishment of system to provide for the collection and recycling of electronic devices in this State is consistent with its duty to protect the health, safety and welfare of its citizens, enhance and maintain the quality of the environment, conserve natural resources and prevent air, water and land pollution. The Legislature further finds that such a system is consistent with the overall state solid waste management policy including its intent to pursue and implement an integrated approach to solid waste management and to aggressively promote waste reduction, reuse and recycling as the preferred methods of waste management • Establish a comprehensive electronics recycling system that ensures the safe and environmentally sound handling, recycling and disposal of electronic products and components and encourages the design of electronic products and components that are less toxic and more recyclable	*Benefits* • Communicates government's intention to reduce role in managing (and paying for) waste and increased role in stimulating waste prevention • Gives support to early, voluntary action by signaling intention to move out of waste management and toward individual responsibility for waste electronics / electrical equipment • Facilitates improvement of overall environmental outcomes, not just waste management • Allows for setting of meaningful targets beyond waste management targets • Gives DAOs the support needed to integrate DfE incentives, utilize mechanisms to penalize non-complying companies, etc. • In the absence of a high level policy commitment on DfE, it is unlikely any progress will be made towards	Low

[39] Polgar, Toth, Szabo. *EU Environmental Law Compliance*, Allan & Overy LLP. www.globalenvironmentalcomplaince.com/demo/Hungary.htm
[40] For more information on Maine's E-Waste Law, visit: http://www.maine.gov/dep/rwm/ewaste/#in

Assessment Summary: Electronics[38]

			MOEA Product Stewardship Policy • Ensure all involved in producing, selling and using products are responsible for the full environmental impact of the product • Provide direction to producers to examine products from a life cycle perspective • Reduce or eliminate the amount and toxicity of waste from products and use materials, energy and water efficiently at every stage of a product's life • Incorporate cost of end of life into the cost of producing a product so that producers and users are paying up front for proper management of waste products. This provides incentives for making end of life management cheaper by making changes in product design	targets on waste prevention and life cycle impact of products	
2 ***Incorporate an incentive for producers to redesign electronics for improved environmental performance*** Follow individual responsibility models to promote and reward innovative solutions (at minimum, allow individual collection for producers who report on methods to meet collection/recovery targets)	Medium term	AB ENV	*Maine's Producer Responsibility System (beginning 1 Jan 2006)* • Maine's regulation on electronics waste requires producers to physically take their products from collection depots and process them according to set standards; or, to pay a bill to the state for processing the collected products on their behalf • Given direct, individual responsibility, producers have incentives to design to reduce their own costs, as they reap the benefits of all improvements *California e-waste Regulation*[41] • A regulation on electronics in California requires all consumers pay an advance recycling fee at point of purchase. The fee is the same for all brands and models in	*Benefits* • Increase the availability of electronics in Alberta with improved environmental performance • Many experts support concept of individual responsibility. When producers take responsibility for recycling and disposing of their discarded products, or pay for someone to recycle and dispose of the products, they have direct incentives to account for these costs in decisions about design and marketing • Regulatory approaches have driven design changes in the electronics and electrical equipment industry in both Europe and Japan (Waste	Medium-High

[41] Personal Interviews with Garth Hickle (MOEA), Frances Edmonds (HP). October 2005. For more details on California's Electronic Waste Recycling Act of 2003, visit: http://www.ciwmb.ca.gov/Electronics/Act2003/

Assessment Summary: Electronics[38]

			each product class • Experts critique the regulation for not stimulating producers to make design changes that will improve environmental life cycle performance *WEEE, RoHS Directives in European Commission* • Regulations identify specific recycling rates to be achieved, and substances of concern to be managed or eliminated, by each Member State *Hungary's implementation of WEEE Directive* • In implementing the WEEE Directive, Hungary (via Decree 264/2004) requires producers inform consumers on: potential disadvantageous effects of e-waste in the environment if not managed according to the Decree; the presences of certain hazardous substances; the consumer's role in contributing to reduce the amount of e-waste • The Hungarian Decree requires producers collect and recover amounts of e-waste stipulated in the EU WEEE Directive. Each year, they must report on amount of products put on the market; method used to meet the collection and recovery obligations; amount of products, by type, that were taken-back, collected, recovered *US EPA DfE Program* • Program staff work collaboratively with industry in sector projects, working to clarify issues and identify solutions • Current DfE partnerships projects include Computer Display Partnership and Printed Wiring Board Partnership relevant to electronics	Electronic and Electrical Equipment Directive (WEEE), Restrictions on Hazardous Substances Directive (RoHS), Energy Using Products Directive (EuP), Japan's Home Appliance Recycling Law and its Law Concerning Rational Use of Energy and its "Top Runner Approach") *Challenges* • Applying taxes, charges or fees based on product or material types and other environmentally preferable attributes is a difficult task as governments are reluctant to "rock the boat" and govern according to "true costs" • Evaluating effectiveness of the many existing program incentives and determining what would work best for Alberta (e.g., Maine, California, European Commission) • Technical challenges of establishing variable fees or charges (i.e., quantifying an environmentally preferable material, determining how many products from a certain brand were sold into Alberta, figuring out how to separate one brand or model from another etc.) • Difficulty separating different brands and models of equipment, as they all look quite similar. Using radio frequency identification (RFID) is one technology that may assist governments in this challenge • Governments implementing programs to promote DfE in the	

Assessment Summary: Electronics[38]

				electronics sector need to be cognizant of putting incentives in place that restrict innovation	
3 ***Work in cooperation with other Provinces to develop a national strategy for managing end of life electronics that shifts responsibility to individual producers***	Short-Long term	AB ENV with other prov's or CCME	• A national approach might be informed by successes and failures of programs in Maine, California, Maryland and Minnesota, as well as European Union member states implementing the WEEE and RoHS Directives • Important to study the fees structures, collection schemes (individual or collective), targets for collection, reuse or recycling, procedures to sort discarded products by producer, methods of dealing with historic waste, roles of producers, distributors and recyclers when considering which approach is best for AB ENV and Canada	*Benefits* ○ Consistent with Canada-Wide Principles for Electronic Products Stewardship set out by CCME EPR Task Force ○ Interviewees noted Europe and California have had more success at promoting DfE as they are more sizable markets with power to leverage industry ○ If Provinces worked together in a more collaborative manner, would offer some consistency and credibility to industry, and provide more of an influence as a larger market ○ If the Provinces took a united approach, industry would have less success lobbying each province individually *Challenges* • Each province's current approach is slightly different, will pose some challenges in determining which approach is more effective and better suited to promoting DfE with incorporation of some incentives • Provinces have not worked well together in the past (environment not a priority, lack of clear provincial, federal direction etc.) • Split in industry (some producers are calling for collective responsibility while others call for individual responsibility)	High

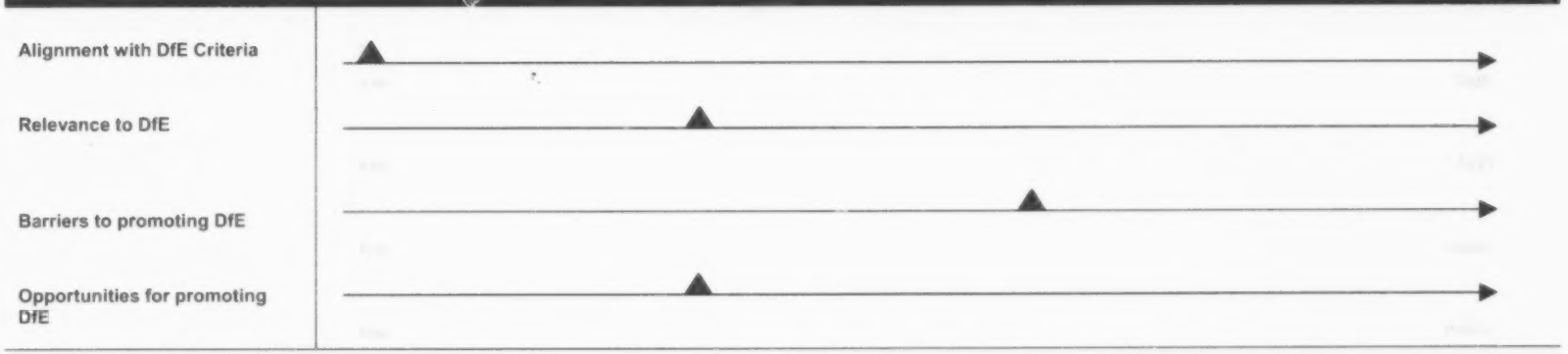
Assessment Summary: Electronics[38]

4 ***Develop a procurement policy for electronics that formalizes the public purchase of environmentally preferable products*** Base criteria on existing knowledge from the EPEAT program, other reporting criteria, or ecolabels such as Energy Star, Canada's Ecologo, Germany's Blue Angel Could be independent or part of larger provincial (or national) procurement strategy on electronics	Medium term	AB Environment, US EPA EPP program manager, other Cnd regions working to develop procurement policies	*Green and Sustainable Purchasing in other Canadian Jurisdictions* • The Government of Alberta can learn from the examples of many other Canadian provincial and municipal governments who have developed their own green or sustainable purchasing strategies, and even partner with these regions to align criteria and leverage more significant purchasing power (Province of British Columbia, Province of Quebec, Regional Municipality of Halifax, Regional Municipality of Whistler, City of Vancouver) *European Union* • The European Union advocates that with so many different products and actors there cannot be one simple policy measure for everything. It therefore utilizes a variety of policy tools; its EU IPP Pilot Projects are complemented by regulation (Energy Using Products (EUP) Directive), promotion of green public procurement policies, and substance bans (Restrictions on Hazardous Substances (RoHS) Directive) • The IPP Approach also emphasizes the role of greener corporate purchasing. Tools for greening both public and corporate procurement include: plain-language handbooks explaining the issues and possibilities; product group databases; and a website housing the handbook, databases and the legislation *Electronic Product Environmental Assessment Tool (EPEAT)* • EPEAT is a procurement tool being developed through multi-stakeholder consensus to help purchasers in the	*Benefits* • Strengthens market demand for products with less environmental impact and encourages producers to offer these products • Follows the lead set by other municipal and regional governments • Providing a positive "pull" effect on the market is viewed favourably by many leading producers who are willing to make design changes if they will be rewarded in the marketplace (e.g., EPEAT) *Challenges* • Securing long-term commitment to sustainable purchasing • Securing the resources necessary to develop skills in life cycle management and total costing, and to cover premiums on more sustainable products • Ability to change current contracting requirements	Medium

Assessment Summary: Electronics[38]

			public and private sectors evaluate, compare and select desktop computers, laptops and monitors based on their environmental attributes • EPEAT evaluates electronic products according to three tiers of environmental performance – Bronze, Silver and Gold. The complete set of performance criteria includes 22 mandatory environmental attributes and 33 optional attributes in 8 categories • Producers may pick and choose among the optional attributes to boost their EPEAT baseline "score" to achieve a higher tier of environmental performance *California Electronic Waste Recycling Act:* • Directive to recommend environmentally preferred purchasing criteria for state agency purchase of certain electronic equipment		

Assessment Summary: Used Oil and Oil Products[42]



Alignment – The policy and objectives of the Used Oil Program are focused strictly on end of life management. Producers have few responsibilities in the Used Oil Management Program other than to participate in the Board. AUMOA has elected to focus on providing incentives for collecting used oil and managing it in an environmentally responsible manner instead of DfE

Relevance - There are fewer opportunities for DfE with oil. DfE is still however somewhat relevant, and it is important to indicate DfE as a long-term policy objective to allow for innovation and alternative technology developments (e.g., synthetic and biobased oils). There are also opportunities to design oil product packaging to be more environmentally responsible and to advance the recovery of used oil.

Analytical Framework for Evaluating the Costs and Benefits of EPR Programmes. Published by the OECD 3 March 2005

- In terms of incentives for "design" changes to oil products, a producers immediate ability to redesign oil products to perform better across the life cycle may be limited by existing vehicle and engine designs. The most apparent environmental improvement opportunities for waste oil are in reprocessing and development of secondary markets. Thus, objectives of waste oil programs have been to increase collection and improve end of life management for used oil.

UK Waste Minimisation and Resources Action Programme

- The UKs WRAP Program sees the DfE opportunities with used oils in the reprocessing industry and the development of secondary markets. With motor oil they are specifically looking at reprocessing technologies and the quality of the oil (e.g., the calorific value and the emissions profile).[43] WRAP provides funding for research and development projects to improve reprocessing technologies and oil quality (e.g., the calorific value and the emissions profile).

Barriers – Producers are given very few responsibilities or incentives in the Used Oil Management Program as the program is focused on collection and recycling. Also no incentives for consumers exist in the current program to select a more environmentally preferable oil product. No targets associated with DfE.

Opportunities for promoting DfE - Based on the review of the existing program and the review of other jurisdictions, few opportunities to promote DfE were identified.

[42] The figure provided to illustrate the assessment summary for Used Oil is based on personal judgements of the Project Team and not on mathematical calculations.

Assessment Summary: Used Oil and Oil Products[42]

Recommendation	When	Who	Examples	Benefits & Challenges	Resource Investment
1 ***Stipulate DfE as a policy objective for Used Oil Stewardship Program*** Expand existing policy objectives to include DfE, focus on waste prevention and reducing life cycle impacts of oil, in addition to current objectives for optimising waste management. *AUOMAs existing policy objectives:* 1. Meaningful accountability to all stakeholders 2. Optimized program recovery rates 3. Informed and participating wholesale suppliers, collectors and processors 4. Responsible management of used oil materials	Short-term	AB ENV	*See example policy objectives from other jurisdictions promoting DfE provided in Beverage Container Table.*	*Benefits* • Indicates intent to both prevent, and effectively manage, waste – puts emphasis on improving life cycle environmental performance, including a focus on design (raw materials, transportation, storage, packaging) • Supports government procurement of lower environmental impact oil products • The policy statement should be realistic about limited redesign opportunities for oil, reflecting a long term commitment to improve the way oil is managed across the life cycle, which includes a focus on design • Having a formal policy objective will help AUOMA to work with producers who complicate the system (e.g., AUOMA currently has the ability to penalize producers who include additives, or develop packaging, that hinders the current recycling abilities of used oil products) • In the absence of a high level policy commitment on DfE, it is unlikely any progress will be made towards targets on waste prevention and life cycle impact of products	Low
2 ***Set a DfE related focus or target for the Used Oil Stewardship Program*** To support consideration of solutions beyond	Medium term	AB ENV	*UK Waste Minimisation and Resources Action Programme* • WRAP provides funding for research and development projects to improve reprocessing technologies and oil quality	*Benefits* • Supports policy objective (demonstrates AB Env is interested and will support any DfE opportunities	Medium

[43] Personal Interview with Mark Barthel, Director of UK WRAP Program. October 2005.

waste management for oil. Examples could include: • Setting a target to allocate a certain amount of R&D funding (under existing R&D Program or new program) for research into development of recycled or bio-based products, or other life cycle performance improvements • Arranging an R&D projects that involves oil producers and other actors from across the value chain as their involvement will help to identify opportunities to reduce the impact of oil over the life cycle			(e.g., the calorific value and the emissions profile). *US EPA DfE Program* • The EPA DfE Program targets industry sectors that face sustainability challenges • In some cases, the EPA approaches an industry sector or association with ideas about what can be done to make performance improvements while in other cases, companies approach program staff with project ideas • Since 1992, the DfE Program has worked with more than 18 industrial sectors to empower industry to incorporate environmental considerations, along with performance and cost considerations, into the product development process (through ecodesign) *IPP Pilot Projects* • In the EU, two pilot projects demonstrate an effective model for engaging industry, consumers and other experts to propose environmental improvements across the life cycle of a product • Goals for this multi-stakeholder project or product panel on oil could be addressing issues with transportation, re-refining, creating market demand for bio-products or rerefined oils etc	that arise over the long term) • Facilitates improvement of overall environmental outcomes for oil, not only waste management • Strives to bring all relevant stakeholders (actors along the value chain) together to identify issues and potential solutions *Challenges* • Securing R&D or innovation funding • It can be challenging to get industry to see government- led voluntary programs as an opportunity instead of threat • To overcome this, some governments have tried to position themselves as a center of excellence who help companies find solutions and realize technical innovations (UK WRAP Program, US EPA DfE Program)	
3 ***Develop a procurement policy for oil and oil products*** Could be independent or part of larger provincial procurement strategy	Medium term	AB ENV	*Procurement: Massachusetts & U.S. Federal Government* • Procurement and contracting measures can compliment end-of-life collection and waste management efforts by creating incentives for re-refined oil products and bio-based products • Green public procurement and corporate purchasing can create demand for	*Benefits* • Provides a market based incentive (pull factor) for producers to introduce products with better environmental performance onto the Alberta market • Formalizes the commitment to purchase re-refined, recycled and bio-based products where appropriate	Medium

Assessment Summary: Used Oil and Oil Products[42]

			product information, pushing responsibility up the supply chain for reporting on percentage of re-refined, bio-based, or other product information related to environmental performance • In 1999, the state of Massachusetts awarded an expanded contract to provide not only various weights of motor oil containing a minimum of 50 percent re-refined base stock, but also recycled antifreeze and other lubricants such as transmission, hydraulic and specialty oils, brake fluid and greases, and an environmentally preferable alternative line of bio-based lubricants for use in automotive and equipment applications BC Government • Recently announced (2004) a "greening the fleet" initiative. Involves conversion of conventional auto leases to hybrid vehicles as well as participation in naw biodiesel demonstration project for provincial and crown fleets	• Strengthens market demand for new products with less environmental impact • Follows the lead set by other municipal and regional governments *Challenges* • Securing long-term commitment to sustainable purchasing • Securing the resources necessary to develop skills in life cycle management and total costing, and to cover premiums on more sustainable products • Ability to change current contracting requirements

APPENDIX 1: DETAILED STUDY FINDINGS

The following tables summarize information obtained through the review of current Alberta Government Waste Stewardship practices, interviews with leading public sector jurisdictions and international experts on DfE and EPR relevant to each of the seven assessment criteria.

Information in each table is organized as follows:

- A description of why the assessment criterion is important;
- A description of current practice from Alberta's four Waste Stewardship Programs in relation to the assessment criteria; and
- Highlights from other leading public sector jurisdictions to stimulate thinking on how to promote DfE in existing and future stewardship programs. Bolded text notes areas of interest for Alberta's consideration when improving existing, or designing new waste stewardship programs.

i) Policy or clear statement of intent

Why is this criterion important?

A clear policy or statement of intent is critical to advancing any strategic objective. This is also true when it comes to governments who want to promote design for environment activities among industry. Stakeholders in some jurisdictions including companies and the public feel government has a key role in encouraging DfE activities among industry and stimulating a market for more sustainable products and technologies. Therefore the policy statement or objectives for the Province's waste stewardship programs should reflect life cycle thinking and stipulate "the promotion of DfE" as a key objective. In absence of a high-level policy commitment on DfE, it is likely that little progress can be made towards targets on waste prevention and life cycle impacts of products.

Alberta Programs	Waste Stewardship Program Current Practice
Used Oil & Oil Products (AUOMA)	• Policy was set by Government of Alberta through the *Lubricating Oil Material Recycling and Management Regulation (#82/97)*. • AUOMAs mission is "to establish and administer used oil materials waste minimization and recycling programs in Alberta". • AUOMA identified 4 goals (policy objectives): 1. Meaningful accountability to all stakeholders. 2. Optimized program recovery rates. 3. Informed and participating wholesale suppliers, collectors and processors, and 4. Responsible management of used oil materials. • Program mission and objectives were set by multi-stakeholder Board of Directors through consultative process (including producers, retailers, consumers, urban and rural municipalities, Province of Alberta and NGOs and the recycling industry). • When the program mission and objectives were developed, concepts of DfE or EPR weren't even on the table.
Beverage Containers (BCMB)	• Policy was set by Government of Alberta through the *Beverage Container Recycling Regulation*. • BCMBs mission is to "oversee a leading, innovative, accessible and cost-effective beverage container management system throughout Alberta". • The BCMB identified five goals (policy objectives): 1. Maximize the recovery of regulated beverage containers 2. Be accountable for the beverage container management system 3. Improve the level of public satisfaction 4. Improve the effectiveness of the system

i) Policy or clear statement of intent	
	5. Minimize the impact of beverage containers on the environment • Program mission and objectives were set by multi-stakeholder Board of Directors through consultative process, including four representatives each from depots and producers, and one each from Alberta Environment, Alberta Urban Municipalities Association, Alberta Environment Network, appointed member by Minister. • When the program mission and objectives were developed, concepts of DfE or EPR were not on the table.
Tires & Electronics (ARMA)	• ARMA Mission is to develop "A sustainable Alberta recycling solution for designated materials that is a model of excellence, environmentally and socially responsible, and economically viable". • Mission and goals were developed by multi-stakeholder Board of Directors and member organizations. • ERA Goals (policy objectives) 1. Enable waste minimization and recycling solutions for all eligible electronics discarded by Albertans. 2. Eligible electronics are recycled in an environmentally and socially responsible manner. 3. Electronics recycling is economically viable. 4. Albertans are aware of and support electronics recycling. 5. The list of eligible electronics is reviewed at least annually, consistent with the Regulation. • TRA Goals (policy objectives) 1. Enable waste minimization and recycling solutions for all eligible scrap tires discarded by Albertans. 2. Scrap tires are recycled in an environmentally and socially responsible manner. 3. Scrap tire recycling is economically viable. 4. Albertans are aware of and support tire recycling. 5. Alberta communities benefit from tire recycling. • Model from Tire Recycling Program was used to create the Electronics Recycling Program Mission, goals and elements of program delivery. • DfE not part of program policy or objectives.

Highlights from Programs in other Jurisdictions

Germany's Green Dot Packaging Legislation

- Germany was among the first to institute a comprehensive approach intended to promote redesign. The Ordinance on the Avoidance and Recovery of Packaging Waste, in short the Packaging Ordinance, came into force in Germany on 12 June 1991. It places a legal obligation on trade and industry to take back and recycle transport, secondary and sales packaging.
- It sets a clear hierarchy for handling packaging waste. The first and foremost policy objective is "**packaging waste must be prevented or reduced**". Secondly, used packaging is to be re-used or recycled by returning it to the production loop. Only packaging waste which cannot be prevented, re-used or recycled may be disposed of by means of incineration or landfilling.
- Furthermore, the Packaging Ordinance Amendment sets targets for the recycling of used sales packaging. Targets differ according to the type of material and must be fulfilled.
- producers in Germany responded to the new law by establishing a non-profit organizations (Duales System Deutschland AG) that created and licensed a logo for participating producers to put on their products. The collection and recycling system for packaging is paid for by the companies that use the logo.

Stewardship Ontario

- The *Waste Diversion Act* sets out the broad parameters for the Stewardship Ontario Program – a program to set up waste diversion program for blue box waste (parameters not specific to DfE).
- Ontario's Waste Diversion Act requires all companies that introduce packaging and printed paper into the Ontario consumer marketplace ("Stewards") share in 50% of the funding of Ontario's municipal Blue Box waste diversion programs.
- Once the Minister designates a material through regulation under the Waste Diversion Act, the WDO must develop a diversion program in collaboration with an IFO.

i) Policy or clear statement of intent

- Companies designated as Stewards for Blue Box wastes can discharge their legal obligations under the WDA through membership in Stewardship Ontario or seek approval from the WDO to implement their own voluntary Industry Stewardship Plan (ISP).

UK WRAP Retail Innovation Program

- Linked policy objectives to EU Landfill Directive (UK has to comply with the terms under this Directive). Recognized increases in recycling rates and composting would help to achieve UK compliance with Directive, however also felt a combination of sustainable design practice and waste management thinking was necessary to effectively address sustainable consumption and production.
- UK strategy to meet EU Landfill Directive includes five policy objectives; one is focused on DfE, to "**Reduce the production of household waste by consumers, particularly the amount of packaging and food they throw away**". The Retail Innovation Program was developed in response to this objective.

Minnesota's Product Stewardship Program

- In 1999, the Minnesota Office of Environmental Assistance (OEA) adopted the first product stewardship policy in the United States.
- The policy was originally developed for Legislative consideration, but the state is now working to meet the objectives of the policy using voluntary initiatives and partnerships with businesses and other governments.
    - Task forces and workgroups on specific priority products — carpet, electronics with CRTs, and paint. Participants include representatives from producers, retailers, local governments, and non-governmental organizations (NGOs).
    - The OEA is also working on specific projects with producers, retailers and others to demonstrate product stewardship.
- The principles of OEA's product stewardship policy are:
    - Ensure all involved in producing, selling and using of products are responsible for the full environmental impact of the product.
    - **Provide direction to producers to examine products from a life cycle perspective**.
    - **Reduce or eliminate the amount and toxicity of waste from products and use materials, energy and water efficiently at every stage of a product's life**.
    - Increase recycling and recovery rates upon disposal of products.
    - Incorporate cost of end of life into the cost of producing a product so that producers and users are paying up front for proper management of waste products. This provides incentives for making end of life management cheaper by **making changes in product design**.
- Minnesota has four product stewardship initiatives currently underway - Electronics, Carpet, Paint, and Automobiles - all having various degrees of success.

European Commission IPP Pilot Projects

- The IPP Pilot Projects were taken on by the EC to demonstrate the applicability of their Integrated Product Policy (IPP).
- Taking an IPP approach, all products cause environmental degradation in some way, whether from their manufacturing, use or disposal. **Integrated Product Policy (IPP) seeks to minimize these by looking at all phases of a products' life cycle and taking action in the design phase where it is most effective**.
- The EC therefore proposes under IPP that with so many different products and actors there cannot be one simple policy measure for everything. Instead a variety of tools - both voluntary and mandatory - can be used to achieve overall environmental improvement. These include measures such as economic instruments, substance bans, voluntary agreements, environmental labelling and product design guidelines.

ii) Policy approach that focuses on results rather than means of achieving them

Why is this criterion important?

Governments need to decide early on in program development whether they want to take a top-down (more prescriptive) or bottom-up strategic approach (more open and general). Having clear priorities and a more prescriptive approach helps government to set outcome related objectives and more concretely measure results whereas bottom-up approaches tend to be favoured by industry because they are more flexible and less prescriptive (e.g., industry can choose improvements in line with their business objectives and innovation cycles). Some experts are also critical of more prescriptive, top-down approaches (i.e., banning a certain substance, mandating a certain % recycled content in packaging) indicating they may be more harmful than beneficial if they do not advocate a life cycle approach and can even dissuade innovation. Determining which approach to take depends on the targeted product or packaging category and the current priorities of the government designing the program, and will ultimately dictate how targets can be set and how program results can be measured.

Waste Stewardship Program Current Practice

All four programs

- Alberta Environment has taken a non-prescriptive approach for all four programs – outlines some desired outcomes but DAOs are free to achieve them in whatever ways they like. As expected, none of desired outcomes are focused on DfE or life cycle thinking.
- Regulations set various parameters for DAO to address, for example
  - What should be included in mission and goals;
  - For used oil, regulation set out who has to participate – created a level playing field by ensuring that all "first sellers" of oil products must register and be part of the program;
  - The electronics regulation defined the scope of what types of products could be included in the program;
  - Environmental handling charges or recycling fees are sometimes specified in the regulation but not always.
- DAOs develop business plans that propose goals and targets. Alberta Environment approves or asks for revisions. Minister of the Environment gives the final approval.
- Recently decided to enact more formal MOUs with DAOs to clarify government expectations about roles, responsibilities, duties, functions, standard of care, policy direction and performance.
- Alberta Environment has taken this approach as they feel the expertise regarding what is feasible resides within the sector and not within government. However Alberta Environment often wonders if this is most effective approach (i.e., Are stretch targets being set? How do we know whether more is possible?).
- Government involvement in AB waste stewardship programs is much greater than in other jurisdictions (Government representative sits on each DAO Board, money flows through DAOs, etc.).
- In two of the four programs, producers are not given any financial or physical responsibility for managing the waste (tires and electronics)
- In the BCMB Program, producers are assigned responsibility through the MOU but it is a collective arrangement where each pays the same amount regardless of product or packaging type (beverage containers).

Highlights from Programs in other Jurisdictions

***This section has been supplemented with additional programs mentioned during interviews, or that the Project Team was aware of, in effort to provide examples of policy approaches in other jurisdictions. Approaches differ depending on the policy context and product category being managed.*

UK WRAP Retail Innovation Program

- Voluntary agreement – *signatories commit to supporting WRAP in achieving its objectives (Courtauld Commitment)*
- Set target (targets described in continual improvement table – criteria vii) but program approach is quite flexible – support a range of projects to achieve target
- They outlined the **following three approaches to achieve this target**:
  - Provide **technical support and "best in class" data** to retailers, brand owners, and suppliers that help them

ii) Policy approach that focuses on results rather than means of achieving them

identify opportunities for reducing the weight of primary packaging, and thus reducing costs of production and transportation.

- **Conduct research** into ways primary packaging can be reduced and make the findings of this research available to retail sector.
- Help reduce the risk of introducing new product and packaging concepts by **funding retailer or brand-led R&D trial and demonstration projects** through its £8 million ($16 million Cnd) Waste Minimization Innovation Fund.

- As program matures (evolutionary approach), WRAP plans to build a more top-level approach into retailers' strategies for product development and innovation.

European Union – IPP Pilot Projects

- **Launched the IPP Pilot Project Program** to **demonstrate how IPP can work in practice, test the methodology and gain some acceptance from industry and the public on the approach**.
- Pilot Projects are instrument to complement regulatory IPP approach
- Taking an IPP approach, **a variety of tools - both voluntary and mandatory - can be used to achieve overall environmental improvement**. This includes measures such as economic instruments, substance bans, voluntary agreements, environmental labelling and product design guidelines.
- EU also launching other complementary policy instruments at the same time: Evaluation of the Environmental Impacts of Products study (technical support project), promotion of green public procurement policies and strategies

European Union Energy Using Products (EuP) Directive

- The EuP Directive **will not introduce directly binding requirements for specific products, but would define conditions and criteria for setting, through subsequent implementing measures, requirements regarding environmentally relevant product characteristics** (such as energy consumption).
- When an energy using product meets certain criteria (significant volume of sales and trade in the internal market (e.g., 200.000 units/year, significant environmental impact, significant potential for improvement), it will be covered by an implementation measure or by a self-regulation measure.
- The EuP Directive will explicitly **require producers to report on their ecodesign activities – does not yet specify what those must be**, but that producers must incorporate DfE tools and techniques in their product development processes.
- The Directive will **give preference to alternative courses of actions such as self-regulation by industry where such actions are likely to deliver the policy objective faster or less costly than mandatory requirements**.
- This approach was taken to ensure the creation of a coherent framework for environmental product policy that avoids the adoption of uncoordinated measures that could lead to an overall negative result (i.e., eliminating a toxic substance from a product, such as mercury from lamps, might lead to increased energy consumption, which on balance would have a negative impact on the environment).

BCs Product Care Program

- **Require that as part of the annual report required of all provincial stewardship programs, the producers or their agency report on the DfE efforts in the industry**.

Maine's Producer Responsibility System (beginning 1 Jan 2006)

- Adopted EPR Legislation for end of life electronics that assigns full life cycle property rights to product procucers.
- Municipalities collect discarded electronics at common collection points. Consolidators record info on how many TVs and monitors are received (including company name).
- Producers are **held responsible for covering costs associated with processing the end of life electronics according to stringent environmental and social standards by either 1) picking up their own electronics and processing them or 2) consolidators recycle it for them and send producers a bill**.
- This system is operating under the assumption that the market will effect change.

ii) Policy approach that focuses on results rather than means of achieving them

Public Procurement Policies

- Many experts and government managers interviewed during the study referred to environmentally preferable procurement as a key complementary policy instrument – using the market to effect behavioural change and DfE activities in industry.

Electronic Product Environmental Assessment Tool (EPEAT)

- EPEAT is a new label or procurement tool being developed through multi-stakeholder consensus to help purchasers in the public and private sectors evaluate, compare and select desktop computers, laptops and monitors based on their environmental attributes.
- EPEAT **evaluates electronic products according to three tiers of environmental performance** – Bronze, Silver and Gold. The complete set of performance criteria includes 22 mandatory environmental attributes and 33 optional attributes in 8 categories.
- **To qualify as an EPEAT product, it must conform to all the mandatory attributes. Producers may pick and choose among the optional attributes to boost their EPEAT baseline "score" to achieve a higher tier of environmental performance**.
- Goals of EPEAT are:
    - Provide marketplace rewards for innovation by clearly recognizing products that reduce environmental and health impacts;
    - Be low cost and without delay in time-to-market for producers;
    - Be transparent and allow flexibility to product designers;
    - Be voluntary but inviting for producers;
    - Address end-of-life issues faced by the reuse and recycling community;
    - Effectively measure products with preferred environmental design; and
    - Be simple and clear to purchasing officials.

Minnesota's E-Waste Stewardship Program

- In 2002, Minnesota **attempted to launch a voluntary e-waste stewardship program** (intended as flexible approach). Producers did not support the program, as they were worried about a level playing field (those producing products in the US may be at a disadvantage with the program than those producing overseas).
- They have not been successful in getting the program up and running - this has lead to a push for regulation. **They have been trying to enact regulations since 1992** but are still trying.
- Industry is split over their approach; some are calling for individual responsibility with no set fees while others are calling for a more collective arrangement with general fees.
- Minnesota may be headed in similar direction as EU where manufacturer pays into 3rd party organization according to fee.

California e-waste Regulation

- Adopted regulation in 2004 that applies an advance disposal fee on new electronics.
- **Consumers pay an advance disposal fee which covers costs of recycling**. Retailers collect the money and remit it to the state on quarterly basis. Money is then paid out to registered collectors or recyclers, **or could be paid back to producers who take back their products for recycling.**
- Producers are required to submit annual reports outlining their efforts from the previous year to redesign for recycling and reduce toxics materials use.
- Industry is split – some like it and others more focused on EPR do not.

Stewardship Ontario Program

- Ontario's Waste Diversion Act requires all companies that introduce packaging and printed paper into the Ontario consumer marketplace ("Stewards") to share in 50% of the funding of Ontario's municipal Blue Box waste diversion programs.
- Once the Minister designates a material through regulation under the Waste Diversion Act, the WFO must develop a diversion program in collaboration with an IFO (flexible approach).
- **WDO and IFO must come up with a diversion program, including targets, and submit to the MOE for review and approval**. There can be multiple back-and-forth negotiations before program plan is approved.

ii) Policy approach that focuses on results rather than means of achieving them

- The IFO must then find companies to pay into the program.
- **Companies or sectors who come forward with acceptable voluntary plans to manage their packaging waste may be exempted from Stewardship Ontario**.

Japan's "Law concerning Rational Use of Energy"

- **Producers are required under law to work to improve the energy efficiency of their products and equipment over time**.
- Japanese government **sets a minimum energy efficiency target for a certain product group based on the current "top runner" (brand and model) in that current year**.
- The Top Runner approach uses, as a base value, the value of a product with the highest energy consumption efficiency on the market at the time of the standard establishment process, and sets standard values by considering the potential technological improvements. This base value is raised continually over time.
- Top runner approach in Japan also combines a communication component so that consumers are provided information concerning energy efficiency at the time of purchase. Penalties are applied when producers do not comply with the display requirements.
- This system is meant to give producers incentives for developing more energy-efficient equipment and move the entire industry forward (not just the leaders).

Germany's Green Dot Packaging Legislation

- The Packaging Ordinance stipulates that used packaging must be recycled and that material-specific recycling targets must be fulfilled.
- Industry contracts with Duales System Deutschland AG with exempt them from their take back and recycling obligations. Producers pay a license fee for the right to use green dot (which signals a closed loop – that the manufacturer of the packaging has paid in advance for its collection, sorting and recycling).
- **Waste management fees are determined using differentiated weight based fees and material specific fees to encourage industry to design its packaging in a more sustainable manner**.

US EPA DfE Program

- The EPA DfE Program targets industry sectors that face sustainability challenges. Staff work collaboratively with industry in sector projects, working to clarify issues and identify solutions. Current DfE partnerships projects include Adhesives Technologies Partnership, Automotive Refinishing Partnership, Computer Display Partnership, the Formulator Initiative, Printed Wiring Board Partnership and others.
- Each DfE partnership project utilizes one or more of the following tools or approaches:
    - Cleaner Technologies Substitutes Assessment (CTSA)
    - Integrated Environmental Management System (IEMS)
    - Life cycle Assessment (LCA)
    - Formulator Initiative
    - Best Shop Practices
    - Greening the Supply Chain
- **Marketing the DfE Program takes a different approach with each project. In some cases, the EPA approaches an industry sector or association with ideas about what can be done to make performance improvements while in other cases, companies approach program staff with project ideas**.
- Since 1992, the DfE Program has worked with more than 18 industrial sectors to empower industry to incorporate environmental considerations, along with performance and cost considerations, into the product development process (through ecodesign)

iii) Incentives for Producers

Why is this criterion important?

To stimulate DfE, producers and not governments, should have direct financial and/or physical responsibility for managing product wastes. The assumption is if producers recycle and dispose of their discarded products, or pay for someone to recycle and dispose of the products, they will have direct incentives to account for these costs in decisions about design and marketing. Without such responsibility, rewards or incentives (such as increased market share, reduced overall costs, avoided fees, avoided regulatory measures), it will be difficult to stimulate producers to invest in creating innovative and environmentally preferable products.

Alberta Programs	Waste Stewardship Program Current Practice

Used Oil & Oil Products (AUOMA)	• Producers have very few responsibilities in the Used Oil Management Program. There are currently no direct incentives for DfE, but mechanisms are in place for the DAO to promote more environmentally preferable packaging for oil products, or to penalize producers using additives which hinder re-use. AUOMA has also approached CPPI to change packaging label types from paper labels to stenciled labeling which facilitates easier recycling – industry uptake has been slow.
	• AUMOA has elected to focus on providing incentives for collecting used oil and managing it in an environmentally responsible manner.
	• AUOMA Incentive Program features the following elements:
	  • Funded through an Environmental Handling Charge (EHC) placed on Wholesale Suppliers.
	  • Private sector Collectors rewarded through Return Incentives (RI).
	  • Coverage assured in all markets through Freight Equalized Zone Pricing for RIs.
	• Therefore, there are incentives to enhance collection of used oil and oil products but none for producers to redesign their products to have improved environmental performance along the life cycle. Return Incentives are paid on the basis of volume of oil, weight of filters, and weight of containers collected.
	• Producers have removed lead from their lubricants and have incorporated thinner walls in containers, however these changes cannot be directly attributed to AUOMA Program.
	• There are only a few examples where interested producers collect and re-refine their own product(s) in a closed-loop system.

Highlights from Programs in other Jurisdictions

- In terms of incentives for "design" changes to oil products, a manufacturer's immediate ability to redesign oil products to perform better across the life cycle may be limited by existing vehicle and engine designs. The most apparent environmental improvement opportunities for waste oil are in reprocessing and development of secondary markets. Thus, objectives of waste oil programs have been to increase collection and improve end of life management for used oil[44].

UK Waste Minimisation and Resources Action Programme

- WRAP **provides funding for research and development projects** to improve reprocessing technologies and oil quality (e.g., the calorific value and the emissions profile).

Procurement, Massachusetts & U.S. Federal Government

- Procurement and contracting measures can compliment end-of-life collection and waste management efforts by creating incentives for re-refined oil products and bio-based products. **Green public procurement and corporate purchasing can create demand for product information, pushing responsibility up the supply chain** for reporting on percentage of re-refined, bio-based, or other product information related to environmental performance
- The State of Massachusetts has provided only re-refined motor oil through the state contract since 1995. In 1999, the state awarded an expanded contract to provide not only various weights of motor oil containing a minimum of 50 percent re-refined base stock, but also recycled antifreeze and other lubricants such as transmission, hydraulic and specialty oils, brake fluid and greases, and an environmentally preferable alternative line of bio-based lubricants for use in automotive and equipment

44 Analytical Framework for Evaluating the Costs and Benefits of EPR Programmes. Published by the OECD 3 March 2005.

iii) Incentives for Producers

applications. Massachusetts also requires contractors collect empty drums, collect and recycle used oil, and educate/train customers on storage and handling, among other services contingent to the sale of these products[45]

- To stimulate demand for bio-based products within the US Federal government, a 2002 Farm Bill program and guidelines outline the preferred procurement of bio-based products, including bio-based lubricants, by Federal agencies. The US Department of Agriculture developed guidelines for this program.46

European Commission IPP Pilot Projects

- In the EU, voluntary product panels of multiple stakeholders have been convened to investigate options for improving product design, but also practices at end-of-life management and other life cycle stages, to reduce environmental impacts and costs.
- Incentives to participate included favourable recognition by government and consumers, access to technical resources for design solutions and mechanism to increase awareness of green products and purchasing.

Alberta Programs	Waste Stewardship Program Current Practice
Beverage Containers (BCMB)	• BCMB funding comes from a levee on both the producers and depots. • For every container returned to system producers and depots are each charged a levee of $0.00045 to cover costs of program, for a total of $0.0009. • Levee is the same for all container types. • Producers initially funded public awareness campaign to inform consumers of recycling fees, deposit system and collection depots. • The BCMB program has mechanisms in place to differentiate packaging according to cost, and ability to recycle (e.g., these are passed along to consumers, consumers pays differential fee depending on recyclability of package material).

Highlights from Programs in other Jurisdictions

UK WRAP Retail Innovation Program

- WRAP identified retailers as an influential decision maker with respect to packaging type and volume. Retailers in the UK specify and or design much of the packaging displayed on their shelves, and pose a significant influence on packaging producers. WRAP engages with retailers (groceries, DIY and household goods) to identify products or categories with potential to reduce packaging waste.
- WRAP **provides retailers, brand owners and suppliers with technical support and "best in class" data on reducing packaging weight** (subsequently reducing production and transport costs). WRAP also makes **its research on reducing primarily packaging freely available** to the retail sector.
- WRAP **funds retailer-led or brand-led research and development, trials and demonstration projects** to mitigate risks associated with introducing new products or packaging concepts (via Innovation Fund of £8 million, or $16 million CAD).
- WRAP received 75 pilot project proposals, which lead to 18 approved projects, £2.46 million assigned and an estimated best-case reduction of 350,000 tonnes of packaging waste (investment of £7.44/tonne).

Stewardship Ontario

- Stewardship Ontario indicated it **plans to introduce fees based on material type and weight to create incentives for design changes to improve and reduce packaging**.

45 The Commonwealth of Massachusetts' Environmentally Preferable Products Procurement Program. Contacts: Ron Whitaker, Procurement Manager, Vehicles and Highway Maintenance, Boston, MA, 617-720-3112,ron.whitaker@osd.state.ma.us; Marcia Deegler, Environmental Purchasing Program Manager, Operational Services Division, Boston, MA, 617-720-3356, marcia.deegler@osd.state.ma.us

46 USDA Remarks News. BIOBASED PRODUCTS STAKEHOLDERS FORUM: USDA Deputy Secretary Jim Moseley October 8, 2002. Washington, DC. Also Greenoco News. Greenoco Corporate Website.

iii) Incentives for Producers

Germany's Green Dot

- Germany's Packaging Ordinance requires producers to take-back and recycle packaging they place on the market, and implementing measures provide financial incentives for DfE.
- To meet requirements, producers choose to pay a fee to Duales System Deutschland AG to handle their packaging in accordance with requirements. **The fees, based on packaging material and weight, correspond to the costs for disposal and recovery that are actually incurred.** Additional packaging means additional waste management obligations and thus additional costs for producers. **Producers opting for low-waste and recyclable packaging save energy and raw materials and therefore pay lower fees.**
    - The program reports that management performance has increased since 1994, cost have fallen and Green Dot has steadily become cheaper for licensees
    - Since 1991, packaging consumption per person in Germany has dropped from 96.8 kilogrammes to 84.5 kg in 2003 (almost 13%).
    - Sales packaging has been modified (refill packs and concentrates replaced voluminous bottles; fewer products use blister packs; very little secondary packaging is made of cardboard or plastic).
- The Green Dot scheme places direct financial responsibility for recycling or disposing of packaging on producers. The fee fluctuates with the amount and type of packaging material. Producers, in fact include the packaging manufacturer, filler, importer, wholesaler, or large trading companies
- This financial responsibility has been credited with packaging designs, such as refill packs and concentrates which replace voluminous bottles, and the reduction in blister packs and secondary packaging made of cardboard or plastic.

Alberta Programs	Waste Stewardship Program Current Practice
Tires (ARMA)	• ARMA has elected to focus on providing incentives for collecting tires and managing them at end of life in an environmentally responsible manner. A secondary focus is finding value added uses for the discarded tires. • Tire producers are not involved in the tire recycling program and do not hold a seat on the stakeholder board (they were not interested in participating). • The Tire recycling program offers R&D funding in two streams: the first for R&D not previously undertaken and non-proprietary; the second for partial R&D (e.g., rebates for computerizing recycling processes and other practices to make recycling more profitable and potentially able to operate without the fee). A project is currently underway with the Alberta Research Council and ARMA to develop a process (devulcanization) whereby the rubber from used tires can be recycled back into new tires (currently not possible without sacrificing quality/durability of tires). • Producers are not involved in the tire recycling program.

Highlights from Programs in other Jurisdictions

UK WRAP Retail Innovation Program

- Immediate opportunities for environmental improvement of tires appear to be in collection, recycling technology and developing secondary markets, and less in redesign of the tire, making it challenging to create design incentives.
- WRAP **innovation funding provides incentives for** producers to investigate environmental design options, end-of-life management practices (in the way ARMA funds new, non-proprietary R&D).

B.C. Product Care

- B.C.'s Product Care program gives producers responsibility for educating consumers on their specific DfE initiatives through mandatory annual reporting.

European Commission IPP Pilot Projects

- In the EU, two pilot projects demonstrate an effective model for engaging industry, consumers and other experts to propose environmental improvements across the life cycle of a product (e.g., for tires, a panel could investigate issues arising from raw materials, manufacturing, transportation, distribution, storage, use and discard as well as value of customer education on

iii) Incentives for Producers
life cycle environmental impacts, and use to promote long life) • Research[47] indicates **legislation enacted to enforce the WEEE and RoHS Directives in Europe has influenced design for dismantling, recycling and material substitutions**.

Alberta Programs	Waste Stewardship Program Current Practice
Electronics (ARMA)	• Following the tire program model, ARMA has elected to focus on providing incentives for collecting electronics and managing them at end of life in an environmentally responsible manner. • Producers do not take on physical or financial responsibilities for managing their products or packaging at end of life as part of the program • Representatives of the electronics industry, including retailers and producers, do comprise an electronics recycling advisory council to provide direction and input to the Alberta Recycling Management Authority (ARMA) Board of Directors regarding Alberta's electronics recycling program. • The chair of the industry council is also on the ARMA Board of Directors.

Highlights from Programs in other Jurisdictions

Maine's Producer Responsibility System (beginning 1 Jan 2006)

- Maine's regulation on electronics waste will require producers to physically take their products from collection depots and process them according to set standards; or, to pay a bill to the state for processing the collected products on their behalf.
- Given direct, individual responsibility, producers have incentives to design to reduce their own costs, as they reap the benefits of all improvements. With collective responsibility (e.g., a common fee to cover recycling costs and a municipality covering collection costs), producers have a disincentive to improve, because they would not be able to capitalize on improvements

California e-waste Regulation

- A regulation on electronics in California requires all consumers pay an advance recycling fee at point of purchase. The fee is the same for all brands and models in each product class. Experts critique the regulation for not stimulating producers to make design changes that will improve environmental life cycle performance.

Electronic Product Environmental Assessment Tool (EPEAT)

- Procurement guidelines for electronics or office equipment are increasingly common, though certainly not harmonised. Criteria typically cover energy use, presence of certain well known problematic heavy metals and substances, as well as lifetime, ability to be upgraded, recycled content and recyclability.[48] Experts do caution that given the speed of innovation in electronics sector there is more opportunity for design change. **Clear directional targets, and not rules specific to certain products or materials, may be most likely to have the desired influence on improved environmental performance through innovation in the long term.**
- EPEAT, a voluntary label under development, aims to strike a balance. It sets both mandatory performance requirements (no mercury, minimum recycled content) and optional performance criteria. Producers applying for the label choose from the optional criteria and are awarded an overall performance score. Purchasers can use a product's score in procurement decisions and in setting targets (e.g., desktop computers purchased must have score greater than X)

[47] Reference C. van Rossem interview, and N. Tojo WEEE and ELV research studies.
[48] One of many examples, the City of Seattle Environmental Questions for Vendors of laptops, can be viewed at http://www.ci.seattle.wa.us/environment/ Documents/Laptops.pdf

iv) Incentives for Consumers

Why is this criterion important?

The "pull" for products with superior environmental performance across the life cycle can be as important as the push. Demand from customers creates a conventional incentive producers understand and respond to via innovation and competition. To better inform customers, mechanisms that draw their attention to the non-monetary consequences of a purchasing choice are needed. These include information about a product's environmental impacts, instructions on product use and disposal, fees or charges levied at the time of disposal (which provide incentives to buy fewer and more durable products, but also provide the customer with the incentive to illegally dump the product to avoid the fee), and advanced disposal fees (which provide customers with incentives to buy fewer and more durable products).

Alberta Programs	A Waste Stewardship Program Current Practice

Used Oil & Oil Products (AUOMA)	• Wholesalers typically pass along environmental handling charges to consumers but they are not always visible:
	  ○ $0.05/litre of oil
	  ○ $0.05/litre of container size
	  ○ $0.50 per filter less than 8 inches
	  ○ $1.00 per filter greater than 8 inches
	• No incentives for consumers to select a more environmentally or socially sustainable product

Beverage Containers (BCMB)	• BCMB program has mechanisms in place to differentiate packaging according to cost, and ability to recycle (e.g., consumers pays differential CR fee depending on recycleability of package material). • A 100% refundable deposit is charged to consumers for each container, redeemable when containers are dropped off at a depot. • The container-recycling fee (CRF) is charged to consumers for each container and is non-refundable, non-regulated and applied by the The Alberta Beverage Container Recycling Corporation (ABCRC). The ABRCRC implemented the Container Recycling Fee on behalf of non-beer beverage producers who sell product in Alberta. • The CRF used to be hidden, but producers chose to make it visible. • The CRF is determined by considering the total revenue from unclaimed deposits, the scrap value of the material and the actual cost of recycling the material (i.e. no fee for aluminum, additional cost for PET plastic as the price of aluminum scrap is much greater than for that of PET). • Although fees are made visible to consumers – they may not see it until they have rung in their purchases (on the bill) and may never see it.
Tires (ARMA)	• When new tires are purchased a $4/tire environmental recycling fee is charged to the consumer (same fee for every brand and model of tire)
Electronics (ARMA)	• Environmental fees are charged to consumers at time of purchase (by small and large retailers). Fees range depending on type of electronics ($5 to $45 depending on the product) but there is no difference between make and models.

Highlights from Programs in other Jurisdictions

Japan's "Law concerning Rational Use of Energy"

- The Japanese Top Runner Program **requires producers provide consumers with information about the product's features, and financially penalizes those who do not (e.g., details on energy consumption).**

Germany's Green Dot Packaging Legislation

- The Green Dot label indicates to consumers that the manufacturer has paid to have the package collected and recycled via the Green Dot system. Green Dot also has publicity programs. "Publicity is essential if the principle of closing the loop is to be anchored firmly in people's minds" and Green Dot programs raise awareness of environmental topics such as the conservation of resources.

iv) Incentives for Consumers

European Union Energy Using Products

- Under the EuP Directive, as drafted, **products awarded the Eco-label will be considered compliant with the Directive's implementing measures, in so far as the Eco-label meets the requirements of the implementing measure (which have yet to be determined).** This would further indicate to consumers which products are deemed environmentally preferable.
- The Commission is conducting preparatory studies and impact assessments which will inform the EuP Directive and identify cost-effective solutions for improving the overall environmental performance of certain products. **Consumer NGOs are a key stakeholder involved** with the Commission in these studies (along with industry and environmental NGOs). Using washing machines as an example, aspects include energy, water and detergent consumption, noise and recycling ability. Stakeholder studies will identify opportunities for improving environmental performance throughout the machine's lifecycle without transferring negative impacts elsewhere (e.g. materials in washing detergent should not cause increased energy use or water consumption). Emerging eco-design requirements would then be legally binding for all washing machines put on the EU market.

European Commission IPP Approach

- The IPP Approach is built on 5 principles, one being involvement of consumers and other stakeholders. The Approach **relies on consumers assessing how to purchase greener [49] products** and how to better use and dispose of them.
- A second principle of the Approach entails governments to set economic and legal framework conditions for economies, using tools like taxes and subsidies, voluntary industry agreements and standardization and **public procurement legislation** (public procurement represents ca. 16 % of Community GDP).
    - Describing taxes and subsidies, the European Commission Communication on Integrated Product Policy notes price signals provide consumers with important information and encourage them to buy products with lower environmental impacts. According to the Commission, "the single most effective measure available to stimulate markets for greener products" [50] is "ensuring the price paid by a consumer for a product includes the costs of all the environmental impacts that it creates".
    - With respect to public procurement, the Commission calls on member states to create action plans for greening public procurement, with ambitious three-year targets that are available to the public.
    - The IPP Approach also emphasizes the **role of greener corporate purchasing. Tools for greening both public and corporate procurement include**: plain-language handbooks explaining the issues and possibilities; product group databases; and a website housing the handbook, databases and the legislation.

Product Eco-label Schemes

- Environmental Choice, Energy Star, and other labels, including new "EPEAT" award labels to products conforming with certain environmental performance measures, and offer a simple indicator to consumers. Labels have been criticized for not promoting overall life cycle environmental performance, however in absence of other decision-making information, might be an adequate tool for environmentally conscious consumers.

[49] In its communication on IPP (June 2003), the European Commission defines greener products as those with lower environmental impacts throughout their life cycle when compared to similar products fulfilling the same function.
[50] European Commission, June 2003, "Communication from the Commission to the Council and the European Parliament, Integrated Product Policy, Building on Environmental Life cycle Thinking" Brussels, 18.6.2003, COM (2003) 302 final.

v) Involvement of actors along the product value chain

Why is this criterion important?

Involving key actors along the product value chain is an important criteria for successful design for environment programs for two reasons:

1) Involving players from across the life cycle including upstream and downstream business partners can help to identify opportunities for DfE that might not have been visible if you only considered gate-to-gate environmental and social factors. Without involving suppliers and customers you are missing out on much of the life cycle.

2) The involvement of stakeholders also adds accountability and credibility to any program. Inclusion of NGOs, consumer interest groups, research and academia ensure that industry and government are held accountable, and can also add value to the program by raising new ideas and potential design solutions. The Director General for the European Union has identified stakeholder engagement as a key element of effective DfE.

Alberta Programs	Waste Stewardship Program Current Practice
Used Oil & Oil Products (AUOMA)	• Program objectives were set and program is managed through multi-stakeholder Board of Directors. • Representatives of the recycling industry are not members of the Board as they are recipients for most of cash flow, therefore slight conflict of interest. • AUOMA program operation involves more than 30 organizations along the oil industry value chain, including producers, the automotive industry, bottle depots, retailers, consumers, recycling associations, environmental groups and government departments.
Beverage Containers (BCMB)	• Program objectives were set and program is managed through multi-stakeholder Board of Directors. • BCMB program operation involves producers, collection agents (depots), provincial and regional government, NGOs and public representatives.
Tires (ARMA)	• ARMAs Stakeholder Board consists of representatives from AB municipalities, recyclers, environmental groups, the public and provincial government • Producers are not involved in the tire recycling program.
Electronics (ARMA)	• Representatives of the electronics industry, including retailers and producers, comprise an electronics recycling advisory council to provide direction and input to the Alberta Recycling Management Authority (ARMA) Board of Directors regarding Alberta's electronics recycling program. • The chair of the industry council is also on the ARMA Board of Directors.

Highlights from Programs in other Jurisdictions

UK WRAP Retail Innovation Program

- UK's WRAP Retail Innovation Program elected **to select a leverage point in the value chain to achieve its program objectives – retailers**
- WRAP decided retailers were a critical player as
    - 35-40% of household waste that ends up landfill began its life as a purchase from the Top 5 Retail Supermarkets
    - they specify much of the packaging that it is offered on their shelves, and design a portion of it themselves
    - they pose a significant influence on producers, and
    - in the UK, stewardship is becoming a key differentiator among retailers (competitiveness factor)
- Retail Innovation program staff work with retailers such as Boots, Sainsbury's and Tesco) to develop markets, explore technical challenges associated with DfE, and connect with producers on these issues.
- Program actively engages with stakeholders further up the supply chain including packers/fillers, packaging converters, and machine system providers. These players are also eligible for funding from Innovation Fund.

European Commission IPP Pilot Projects

- One of **main goals of IPP Pilot Project exercise was to bring multiple stakeholders from along the product chain to**

v) Involvement of actors along the product value chain

the table to assist in the identification of environmental/social impacts along the life cycle and improvement options.

- Stakeholders involved in IPP Pilot Project on cell phones included producers (Nokia, Motorola, Panasonic), component producers (Epson, Intel, AMD), Government organizations (UK Defra, European Commission), Telecom operators/Retailers (France Telecome, Vodafone, Teliasonera), NGOs (WWF), Consumers (BEUC), Research Institute (Finish Env Institute).

Minnesota's Product Stewardship Program

- One of the formal principles of OEA's product stewardship policy is to "Ensure all involved in producing, selling and using of products are responsible for the full environmental impact of the product".
- The OEA seeks to achieve its policy's objectives through voluntary efforts and initiatives **that include setting up task forces and workgroups on specific priority products**. Participants include representatives from producers, retailers, local governments, and non-governmental organizations (NGOs).

Germany's Green Dot Packaging Legislation

- Duales System Deutschland AG **cooperates with many different players along the value chain during program implementation**, including fillers, importers, packaging producers, local and international authorities.

Stewardship Ontario

- **Minister of the Environment wanted the program to incorporate a multi-stakeholder approach.**
- Board consists of industry representatives, municipal and provincial government representatives, and NGOs.
- Important element of program is transparency – majority of meetings and webcasts are open to the public – Ministry of the Environment sees this as key to good governance.

vi) Feasible for Government to Manage and Enforce

Why is this criterion important?

If government cannot effectively manage and enforce the stewardship program, it may be difficult to get industry to participate (many are reluctant if there is potential for free riders, etc.). Program managers will also need to demonstrate to cabinet and taxpayers that the money spent on their program is worthwhile, achieving its objectives, and is providing value for society. Having proper enforcement mechanisms also help government to manage risk, especially in programs where substances of concern might be involved.

Alberta Programs	Waste Stewardship Program Current Practice
All four programs	MOUs • Gov AB establishes MOUs with each industry sector. • DAO required to submit 3-year business plan each year for review and approval by Minister, and then annual repot showing progress against goals. • All plans and reports are subject to FOIP and records management procedures. Accountability Workbook • Expanded governance accountabilities are reviewed using workbook, used by EC as well.
Used Oil & Oil Products (AUOMA)	• Gov AB is ultimately responsible for regulatory compliance and the DAO responsible for program compliance. However recently started to work together on regulatory compliance enforcement issues as DAOs work more closely with retailers and processors. • Each participating collector and processor must register with the Association by submitting appropriate forms and providing documentation verifying that the company has the required government approvals with respect to their specific operations (i.e., copies of the company's Alberta Safety Fitness Certificate, verification that the company drivers maintain current transport of dangerous goods (TDG) training, copies of Alberta Environment Operating Approval, copies of valid permits or licenses from other governing jurisdictions). • Under the authority of Regulations enacted by the Gov of AB, wholesale suppliers failing to register or remit EHC may be subject to significant fines and removal of business licenses. • There have been instances where regulatory non-compliances have allegedly occurred but not detected by government. There have also been some complaints from different competitors about handling practices. A third party audit and verification system could alleviate these problems and concerns. A third party system could also provide useful feedback to Alberta Environment regarding the effectiveness of regulatory provisions.
Beverage Containers (BCMB)	• It is manufacturer's responsibility to come to BCMB to get approval before selling products. • BCMB conducts random audits of producers through retail visits – look for beverage packaging that may not be registered. Very little gets by.
Tires (ARMA)	• 3rd Party verification of end use or customer is required (ARMA tracks movement of all tires) • If being exported, customs records and weigh scale bills are used as verification
Electronics (ARMA)	• Retailers are audited (approximately 200 random audits are conducted in Alberta each year) and risk assessments are completed to ensure proper application / collection of recycling fees • Electronics recyclers must be certified by ARMA to be able to participate as vendors in the program • A formal process for appeal built into the auditing system

vi) Feasible for Government to Manage and Enforce

Highlights from Programs in other Jurisdictions

European Commission IPP Pilot Projects

- As program was voluntary in nature and each pilot project unique, **no formal accountability mechanisms** were built in aside from regular progress reports that each industry proponent must prepare
- All players wanted a successful outcome that could be widely communicated – this was a real driver to proceed with the work.

Maine's Producer Responsibility System (beginning 1 Jan 2006)

- As program has not yet been launched, difficult **to know whether government will be able to enforce the program effectively**.

Minnesota Product Stewardship Program

- Program is voluntary, **level of enforcement limited by voluntary nature of each program** (i.e., The MOU agreement signed with Carpet America Recovery Effort (CARE) promotes product stewardship for carpet by *asking* producers to meet goals for reuse and recycling of waste carpet).
- In the *Electronics Recycling Demonstration Project* (under electronics stewardship program), OEA, Sony Electronics, Panasonic-Matsushita, Waste Management's Asset Recovery Group and the American Plastics Council formed a partnership in 1999 to jointly fund and conduct a statewide electronics collection and recycling project. The project tested a product stewardship framework for managing old consumer electronics (5 year commitment).
- This pilot program can be seen as interim measure that is providing useful information and experience to help achieve the state's goal of establishing a national electronics collection and recycling program in partnership with the electronics industry. This interim measures does not meet the state's criteria for product stewardship and may or may not continue after the initial 5 year commitment.

Germany's Green Dot Packaging Legislation

- As the organizer of waste separation and recycling in Germany, Duales System Deutschland AG must ensure the program meets the law and collection and recovery targets. In their function as the competent supervisory authority, it is up to the environment ministries of the federal states to ensure that these targets are met.
- The instrument **used to ensure the program meets its targets is the mass flow verification**, which acts as a "performance record" and documents the collection and recovery performance of the company.
- Over and above the requirements of the Packaging Ordinance, the company has also been **publishing a voluntary environmental performance balance** since the year 2000, which expresses the actual savings in primary energy and CO_2 emissions in concrete figures.

Stewardship Ontario Program

- Once Minister has designated a material through a regulation under the Waste Diversion Act, the Minister requests that WDO develop a diversion program in cooperation with an Industry Funding Organization (IFO). The Minister may request specifics on timeline of implementation or on delivery plan.
- WDO and IFO develop diversion program and solicit input from municipal governments and NGOs. Program plan is then submitted to Minister for review and approval.
- Minister has quite a bit of influence here to request a change (i.e., increase in target) and there may be back and forth negotiations before final program plan is approved.
- WDO and IFO must **report on progress made towards targets and objectives annually**.
- It is the responsibility of the IFO to find companies to pay into the program – this is challenging and laborious for Stewardship Ontario, slight policy gap.
- Enforcement is limited by provincial law - difficult to use provincial law to effect non-resident organizations.

vii) Continual improvement is implicit in program design

Why is this criterion important?

The importance of setting DfE targets that are meaningful and measurable is critical to advancing an effective DfE Program. Behavioural change in industry is triggered when targets are set that outline a minimum standard of acceptable performance and reward above and beyond performance. It is important to note the linkage between this criteria and the policy statement. Without a strong commitment to DfE in a high level statement of intent or policy, it will be difficult to set specific targets on DfE.

Progress made towards targets must be monitored and reported on regularly to ensure program participants and external stakeholders view targets as legitimate goals to strive towards. Continuing to raise the bar over time is also an important element of moving an industry forward. Some companies may need time to adapt (and might even be reluctant to change) whereas other companies will want to set themselves apart from their peers by taking a leading approach, and should be rewarded.

Alberta Programs	Waste Stewardship Program Current Practice

Used Oil & Oil Products (AUOMA)	• DAO required to submit 3-year business plan each year for review and approval by Minister, and then annual report showing progress against goals.
	• Targets for set by program management with input from industry.
	• Targets set out in 2005-2007 Business Plan include:
	  ○ *Maximize* collection of env handling charges
	  ○ *Maximize* flow-through of EHCs to RIs
	  ○ *Avoid* cross subsidization
	  ○ *Encourage* a self-sustaining used oil material recycling industry
	  ○ Deliver *effective* governance
	  ○ Ensure full accountability
	  ○ Maintain program consistency across other provinces
	  ○ Promote increase in recovery rates
	  ○ Monitor acceptable markets for processed used oil materials (not landfilling or road oiling)
	  ○ Etc....
	• AUOMA sets measurable goals for each of the targets mentioned above.
	• No targets associated with DfE.
	• Continual improvement also implied in that AUOMA has a vision of expanding program across Canada. Already in five provinces with very strong results (BC, AB, MB, Saskatchewan and Quebec).

Beverage Containers (BCMB)	• DAO required to submit 3-year business plan each year for review and approval by Minister, and then annual report showing progress against goals.
	• In past have had too many targets and targets that are impossible to measure.
	• Now revisiting their targets and developing a new, smaller set of more measurable targets. New list of targets includes:
	  ○ Cost per container returned
	  ○ # of barrels of oil saved by recycling
	  ○ GHG emissions avoided
	  ○ # of containers returned
	  ○ # of m3 of land saved by avoiding use of landfill
	  ○ # of complaints addressed
	  ○ Conduct customer satisfaction review
	• Would like to increase current rate of recovery and recycling from 80 to 85%.
	• No targets associated with DfE.

vii) Continual improvement is implicit in program design	

Tires (ARMA)	• DAO required to submit 3-year business plan each year for review and approval by Minister, and then annual report showing progress against goals.
	• Targets include
	  ○ Total # tires processed/per tires sold
	  ○ # new products created from recycled tires
	  ○ # new markets created for recyclers
	• No targets associated with DfE.

Electronics (ARMA)	• DAO required to submit 3-year business plan each year for review and approval by Minister, and then annual report showing progress against goals. • No evidence of targets found. • It has been noted targets will be present in ARMAs next business plan.

Highlights from Programs in other Jurisdictions

UK WRAP Retail Innovation Program

- Program Targets:
  - **To design out packaging waste growth by 2008**
  - **To deliver absolute reductions in packaging waste by 2010**
  - To identify ways to tackle problem of food waste
  - **Those signing up to commitment represent 90% of market share in UK grocery market**

European Commission IPP Pilot Projects

- **Targets/goals were qualitative** – 1) to **bring multiple stakeholders together** (in product panel format) to identify more sustainable solutions and 2) to **create two successful communication pieces/stories** that can be shared with European Member States (demonstrating how the IPP methodology can be practically applied)
- The EU felt that to set smart targets, needed to get a multi-stakeholder group together to discuss and determine targets in consensus based setting.
- EU feels stakeholders from along the product chain can assist in the identification of environmental/social impacts along the life cycle, and can help with brainstorming improvement options.
- Other experts agreed that multiple stakeholder groups should come to a common understanding of the life cycle issues associated with a given product in order to set feasible and meaningful targets and to structure a smart policy framework.

Stewardship Ontario

- **Sets recovery targets by material type, and an overall waste diversion target**, for each year
- The Rules that govern the Blue Box Program Plan (BBPP) are modified each year by the Minister of Environment and the WDO for the following reasons:
  1. Annual address changes to dates,
  2. Annual changes in material fee rates,
  3. Clarify the Rules for stewards, and
  4. Address shortcomings that come to the attention of Stewardship Ontario to ensure a level playing field.
- Stewardship Ontario plans to raise the bar by stepping up incentives for behavioural change through increased separation of material groups and variable fees assigned according to a formulae that includes three factors: recovery rate, cost to manage at end of life, equalization factor (similar to Green Dot).

Germany's Green Dot Packaging Legislation

- **Sets recovery targets by material type for each year**

Japan's "Law concerning Rational Use of Energy"

vii) Continual improvement is implicit in program design
• Producers are required under law to work to improve the energy efficiency of their products and equipment over time. • Japanese government sets a minimum energy efficiency target for a certain product group based on the current "top runner" (brand and model) in that current year. • The "Top Runner" approach **uses, as a base value, the value of a product with the highest energy consumption efficiency on the market at the time of the standard establishment process, and sets standard values by considering the potential technological improvements. This base value is raised continually over time.**

Appendix 2: Representatives of the Government of Alberta and Delegated Administrative Organizations (DAOs) Interviewed

The following five representatives were interviewed during Phase 1 of the study.

Name	Function	Contact Information
Dennis Hambleton	Executive Director Alberta Used Oil Management Program	DHambleton@usedoilrecycling.ca 780-504-8847
Patrick Kane	Team Leader Action on Waste, Alberta Environment	Patrick.kane@gov.ab.ca 780-422-2136
Janet McLean	Manager of Land Systems Alberta Environment	Janet.mclean@gov.ab.ca 780-427-9888
Bob Saari	Executive Director Beverage Container Management Board	Rsaari@bcmb.ab.ca 780-424-3193
Doug Wright	Executive Director Alberta Recycling Management Authority	Dougwright@albertarecycling.ca 780-415-8366

APPENDIX 3: INTERVIEW QUESTIONS

Interviews with Alberta Waste Stewardship Program Managers and Staff

Context

Our Project Team is currently working on behalf of Alberta Environment to assess design for environment (DfE) opportunities in relation to the province's existing Waste Stewardship Programs. The results of the assessment will help Alberta Environment continually improve its waste management policies and programs through an improved understanding of the alignment, relevance, opportunities and barriers to integrating DfE and other stewardship approaches. To ensure our Team has a good understanding of current policies and practices, organizational structure and responsibility centres, potential challenges and opportunities, we are interviewing program managers from Alberta's three Delegated Administrative Organizations (DAOs) and Alberta Environment.

Questions

1. Could you briefly describe your roles and responsibilities and involvement with the province's waste stewardship program(s)?
2. How were the mission and goals developed for the stewardship program(s) (e.g., internally, in consultation with industry, other stakeholders, etc.)?
3. How does the program currently operate? How is waste from that particular product group managed?
4. How is the program financed?
5. How are accountabilities and responsibilities for program implementation assigned and reviewed?
6. How are targets for improvement set? How are results measured? Please consider quantitative (e.g., business, environment or social metrics) and qualitative benefits (e.g., behavioural changes).
7. Who are the key stakeholders and how are they currently engaged in program design and delivery?
8. In your opinion, are there incentives in the program for producers to take environmental considerations into account upstream at the design phase, or for consumers to choose products or packaging with better environmental performance over the life cycle? Please describe.
9. In your opinion, what are the main challenges and barriers related to program implementation and how have these been addressed (or not addressed)?
10. If you could go back in time and design and implement the program over again, what would you do differently?
11. Do you have any additional comments?

Thank you for participating in this interview.
Your insights are greatly appreciated!

APPENDIX 4: PUBLIC SECTOR JURISDICTIONS INTERVIEWED

The following individuals from leading public sector jurisdictions were interviewed or responded to the questionnaire.

Name	Organization	Contact Information
Mark Barthel	Special Adviser Waste & Resources Action Programme, Retail Innovation Team	Mark.Barthel@wrap.org.uk Tel: 01295 819645
Bengt Davidsson	European Commission Integrated Product Policy Pilot Projects and Energy Using Products Directive	Bengt.DAVIDSSON@cec.eu.int Tel: 0032.2.298.7514
Garth Hickle	Product Stewardship Team Leader Minnesota Office of Environmental Assistance	Garth.Hickle@state.mn.us Tel: (651) 215-0271
Derek Stephenson	Program Manager Stewardship Ontario	dstephenson@stewardshipontario.ca Tel: (416) 594-3459
Chris van Rossem Derek Stephenson Joanne St. Godard Martin Charter	German Green Dot Program	

APPENDIX 5: PUBLIC SECTOR JURISDICTION INTERVIEW QUESTIONS

Interviews with leading public sector organizations

Context

Our Project Team is currently working on behalf of Alberta Environment to assess design for environment (DfE) opportunities in relation to the province's existing Waste Stewardship Programs. The results of the assessment will help Alberta Environment continually improve its waste management policies and programs through an improved understanding of the alignment, relevance, opportunities and barriers to integrating DfE and other stewardship approaches.

In order to identify opportunities for improving upon their current stewardship practices, we are hoping to learn about challenges and opportunities other jurisdictions have realized by incorporating DfE principles and incentives into existing waste stewardship programs. To gain this knowledge we intend to interview program managers from five leading public sector jurisdictions and other international experts on DfE and EPR. Your program has been identified as a successful initiative that demonstrates how government can support and encourage industry to redesign their products and packaging to reduce impacts along the life cycle.

Questions

1. Could you briefly describe your roles and responsibilities with the stewardship program?
2. How were the mission and goals developed for the stewardship program (e.g., internally, in consultation with industry, other stakeholders, etc.)?
3. Could you provide a high level summary of how the program currently operates? How is waste from that particular product group managed?
4. How have you attempted to encourage industry to redesign their products or packaging to reduce impacts along the life cycle (please consider complementary policy instruments in addition to the program itself)?
5. What incentives are in place for producers to take environmental considerations into account upstream at the design phase, or for consumers to choose products or packaging with better environmental performance over the life cycle?
6. How is the program financed?
7. How are accountabilities and responsibilities for program implementation assigned and reviewed?
8. How are targets for improvement set? How are results measured? Please consider quantitative (e.g., business, environment or social metrics) and qualitative benefits (e.g., behavioural changes).
9. How are stakeholders currently engaged in program design and delivery (e.g., industry participants, non-governmental organizations, citizens, other government agencies, etc.)?
10. In your opinion, what are the main challenges and barriers related to program implementation and how have these been addressed (or not addressed)?

11. If you could go back in time and design and implement the program over again, what would you do differently?

12. Do you have any additional comments?

Thank you for participating in this interview.
Your insights are greatly appreciated!

APPENDIX 6: INTERVIEWS WITH INTERNATIONAL EXPERTS ON DFE AND EPR

The following five international experts were interviewed, or responded to the questionnaire during the study.

Name	Function	Contact Information
Martin Charter	Centre for Sustainable Design, Surrey Institute of Art and Design	martincharter@compuserve.com] Tel: +44 (0) 1252 89 2772
Frances Edmonds	HP Canada	frances.edmonds@hp.com Tel: (905) 206-4208
Joanne St. Godard	Executive Director Recycling Council of Ontario	Joanne@rco.on.ca Tel: (416) 657-2797 ext. 1
Chris van Rossem	Lund University	chris.van.rossem@iiiee.lu.se
Mary Cushmac ***Interviewed as part of a study on Sustainable Technology Innovation for Industry Canada. March 2005.*	Program Manager US EPA DfE Program, Economics, Exposure and Technology Division Office of Pollution Prevention and Toxics	Cushmac.Mary@epamail.epa.gov Tel: (202) 564-8803

APPENDIX 7: INTERNATIONAL EXPERT INTERVIEW QUESTIONS

Interviews with international experts

Context

Our Project Team is currently working on behalf of Alberta Environment to assess design for environment (DfE) opportunities in relation to the province's existing Waste Stewardship Programs. The results of the assessment will help Alberta Environment continually improve its waste management policies and programs through an improved understanding of the alignment, relevance, opportunities and barriers to integrating DfE and other stewardship approaches.

In order to identify opportunities for improving upon their current stewardship practices, we are hoping to learn about challenges and opportunities other jurisdictions have realized by incorporating DfE principles and incentives into existing waste stewardship programs. To gain this knowledge we intend to interview program managers from five leading public sector jurisdictions and other international experts on EPR and DfE. Your insights and expertise in this area will help Alberta Environment stimulate and encourage industry to take more responsibility for its products along the life cycle.

Questions

1. What can government do to stimulate and encourage industry to improve the design of their products and packaging to reduce impacts along the life cycle?

2. Can you point to any examples where government has successfully encouraged industry to redesign their products or packaging to reduce impacts along the life cycle? Why were these examples successful?

3. What challenges and barriers do governments typically encounter when trying to promote DfE among companies or industry sectors?

4. What can be done to overcome these challenges and barriers?

5. Do you have any additional comments?

Thank you for participating in this interview.
Your insights are greatly appreciated!